

MODEL AIRCRAFT

Monthly

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INSIDE

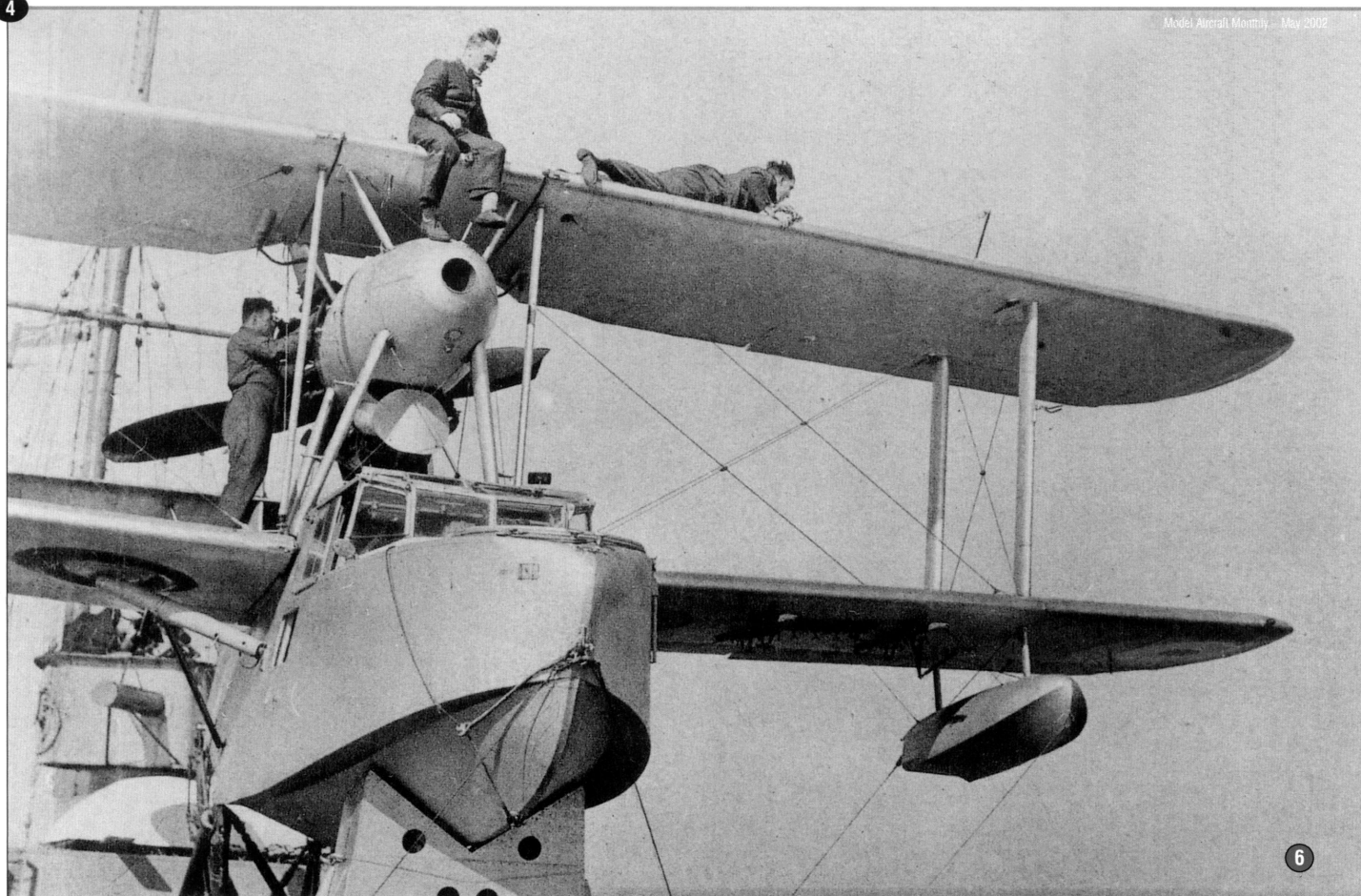


TO WIN
See Page 41

Volume 1 Issue 5 May 2002 £2.75



- Tupolev Tu-2 • Aardvarks and Electric Foxes • Supermarine Walrus • Kbely Jets
- RNZAF Kittyhawks Pt.3 • Tiger-Striped Sea King • Lavochkin La-250 • Hampden

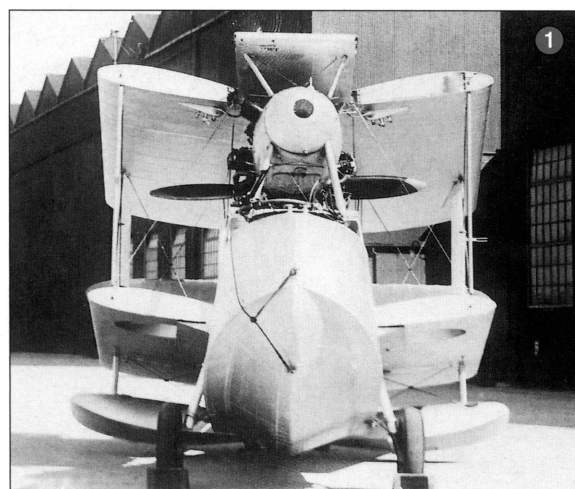


Aspects of the Walrus

WALRUS: AN AQUATIC, WEB-FOOTED CARNIVOROUS ANIMAL ALSO CALLED THE MORSE OR SEAHORSE. NAME OF SCANDINAVIAN ORIGIN, PLURAL: WALRUS OR WALRUSES

The Walrus came into existence as a result of a request from the Australian government for a metal amphibian with a crew of three, folded wings and the ability of the aircraft to pass through the aircraft hatch of the seaplane carrier HMAS Albatros. The aircraft was also to be stressed for catapult launching. Albatros actually paid off in 1933 and was transferred to the RN in 1938 to lead a remarkable career as a carrier, landing craft and migrant ship.

No British company was interested in building such an aircraft as the number required by the Australians would be small and at that time the Fleet Air Arm preferred floatplanes such as the Fairey III F for catapult service. Eventually the Supermarine Division of Vickers, which had provided the earlier Seagull Mk IIIs used by the Australian Navy, yielded to the persuasive powers of Air Commodore Sir Richard Williams, the Australian Chief of Air Staff, and a project to meet the requirements was started. The Supermarine Vickers designation was the Type 236 but progress was slow, however the first flight of the new amphibian known as the Seagull Mk V took place on June 21st 1933. It appeared at the Society of British Aircraft Constructors at Hendon and gave an excellent flying display. The

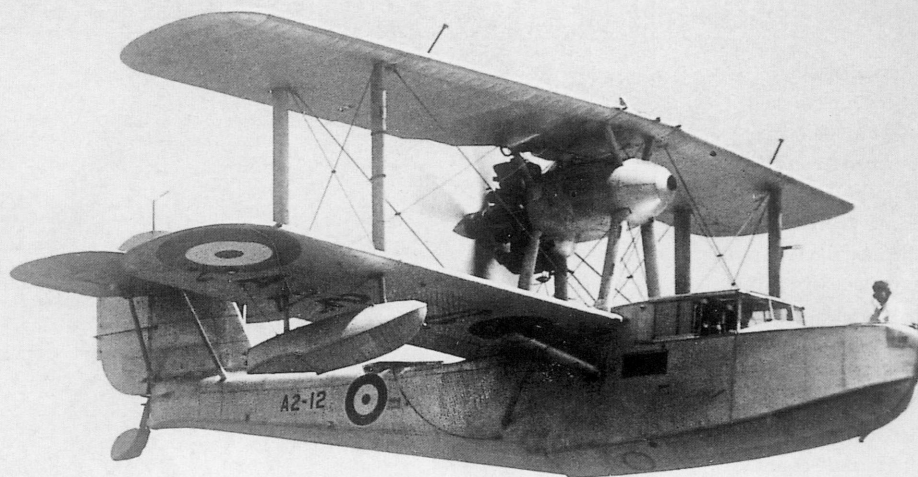


by Harry Woodman

1. The prototype Seagull V at Woolston in 1933. Note the towing gear stowage, the lack of bomb wells and the old Scarff No.7 ring fitted to the bow cockpit. The jury struts were meant to be fitted only when the wings were folded but most photos. of Walrus show that these struts were usually permanently left in place

prototype number N.2 was then tested at the Marine Aircraft Establishment at Felixstowe, which included catapult testing; as a result of this the hull area near to the catapult lugs was strengthened. The Seagull V was really still a private venture

2



6. A Walrus I (probably K8339) on the catapult of HMS London in the late 1930s. The need to make the wing areas capable of taking the weight of a man is well displayed here. Note the item supporting the bow and the securing lines

2. A nice air shot of Seagull V A2-12 circa 1937. Completed in 1936 this amphibian saw service with HMAS Australia. Note that jury struts are not fitted

3



3. The first production Walrus I K5772 under test at Woolston and seen here mounting the ramp in March 1936

5. Another view of L2191 wearing the pale blue sash of 712 Flt of the 2nd Cruiser Squadron. The machine was carried on HMS Newcastle and is seen here at Lee-on-Solent in 1938 with target-towing winch fitted. Note that the rear interplane struts were more substantial than the leading members

5



aircraft created specifically for the Royal Australian Navy, although the British Admiralty, who were beginning to show some interest, carried out an assessment of the amphibian on behalf of the Australians. In 1935 N.2 was embarked on HMS Courageous for passage to Gibraltar where operational sea trials were carried out with the involvement of HMS Valiant. The aircraft proved to be seaworthy and was allocated the RAF serial K4797 and handed over to the Royal Navy on January 1st 1935. In the meantime the Australians had already reached a decision and ordered 24 of them at a cost of £345,000.

The first Australian Seagull V numbered A2-1 was earmarked for HMAS Australia which arrived in British waters in March 1935. Her crane was modified to lift heavier aircraft and a type EIIIIH catapult was fitted. Eventually catapults and Seagull Vs were mounted on the heavy cruiser Canberra and the light cruisers Hobart, Perth and Sydney. The armed merchant cruisers (AMCs) West Australia and Manoora carried Seagull Vs but without catapults. The Royal New Zealand Navy's two cruisers Achilles and Leander were fitted with catapults and Seagulls.

The Seagull V design team was headed by R. J. Mitchell and it was almost the last of a type of small pusher-biplane flying boats which had originated in the very early days of aviation. Mitchell and his team had been successful in producing racing flying boats in the 1920s (the Sealion series), all with wooden hulls. However, the specifications laid down by the Australians required a metal hull and by February 1933 a new single-step Alclad hull had been developed. Eventually the Bristol Pegasus 750hp radial engine was decided upon as a powerplant. The need to protect the propeller from spray had been the main reason for the configuration of all the earlier boats and a high-mounted pusher engine was the usual solution. With the Seagull V the proximity of the propeller to the tail surfaces meant that the slipstream on the fin would cause the aircraft to yaw and to avoid this the engine nacelle was offset so that the thrust of the engine was three degrees from the fore and aft line of the hull. To keep the propeller small, two two-bladed ones were mounted as a four-bladed unit. The Seagull V was actually the first British military aircraft to employ a retractable undercarriage, the wheels being pulled up into wells in the undersurface of the lower wings.

As mentioned above, the Seagull V N.2 was purchased by the Air Ministry and was dispatched to Lee-on-Solent in 1935, receiving the serial K4797 and taken on board HMS Nelson. In May 1935 the Air Ministry placed an order for twelve Seagull Vs, the type now receiving the name Walrus. The strength of the hull and the general ruggedness of the structure compared with the notorious weakness of float seaplanes, especially during recovery, helped to swing naval opinion. In July 1936 Vickers Supermarine received an order for 168 Walruses but the welcome order soon presented difficulties. The Air Ministry had just presented an order for 310 Spitfires and the factory facilities were badly stretched. As a result Walrus production was transferred to Saunders Roe (SARO) at Cowes, that company eventually building the Mk II variant with a wooden hull in order to conserve metal stocks.

The Walrus was one of those few aircraft adopted as a service type before 1939 remaining in service at the end of the war with few changes, and even after, as a static training airframe apart from some civil use. The larger cruisers and some battleships were equipped with catapults with one or more Walruses during the earlier years of the war acting as spotters for the big ships. As the war progressed the amphibian nicknamed 'Shagbat' (origin unknown but may have a sexual connotation) and the 'Steam Pigeon' (from a tendency to give off steam when spray splashed over the hot engine) took part in many activities, including one hair-raising episode as a dive bomber! It saw service in every theatre of war from the Barents Sea and the North Atlantic to the



Bay of Bengal and the Pacific. It is most fondly remembered by the surviving aircrew for its role in the Air Sea Rescue Service (ASR), particularly along the South-East Coast during 1941-2. By the end of production Vickers Supermarine had built a total of 285 Walruses and Saunders Roe 461, of which 191 were Mk IIs, a grand total of 746.

Armament Notes

The Walrus was armed initially with two 0.303in Mk III Lewis guns carried inboard and when occasion demanded, removed and mounted on a 'jockey mount' (a crutch) fitted to the fore and aft gun rings. The mount was virtually identical to some fitted to British and German aircraft of WWI, the mount moving around a perforated circular belt (only a section in the rear cockpit) with no provision for elevation. The mount did at least have one feature, a 'wind balancing mechanism' which in simple terms meant that when the gunner swung the weapon into the slipstream he was assisted by a strong compression spring unit. By the late 1930s the Lewis was being replaced by the Vickers 'K' gun which employed circular magazines like the Lewis (often confusing writers), and it had a higher rate of fire.

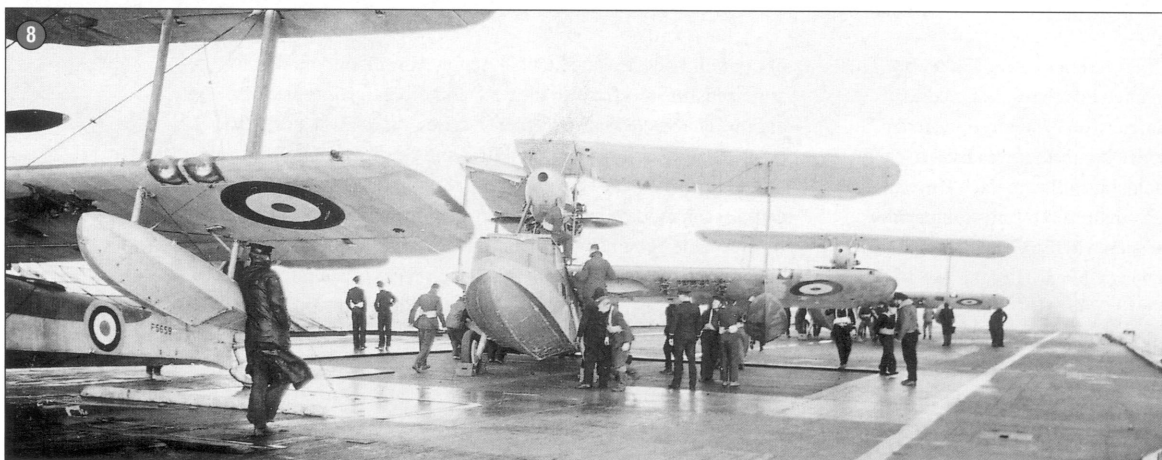
The official bomb standard for the Walrus included a variety of ordnance, some of which was obsolescent by 1939. The original specification listed 20lb bombs (in fact the old WWI Cooper and the equally elderly Woolwich 112lb HEs).

The Walrus straddled a period when new types of bombs and carriers were being introduced into the RAF, and the equipment fitted to production machines remained unchanged throughout the war. The under surface of the lower wing was

4. The activities at Lee-on-Solent (HMS Daedalus) where FAA TAGs (Telegraph Air Gunners) were trained was the subject of a feature in the weekly 'Flying' magazine. This shot shows off the rivet detail, the rear cockpit cover, the rear catapult lugs and the perhaps inadequate seaman's uniform



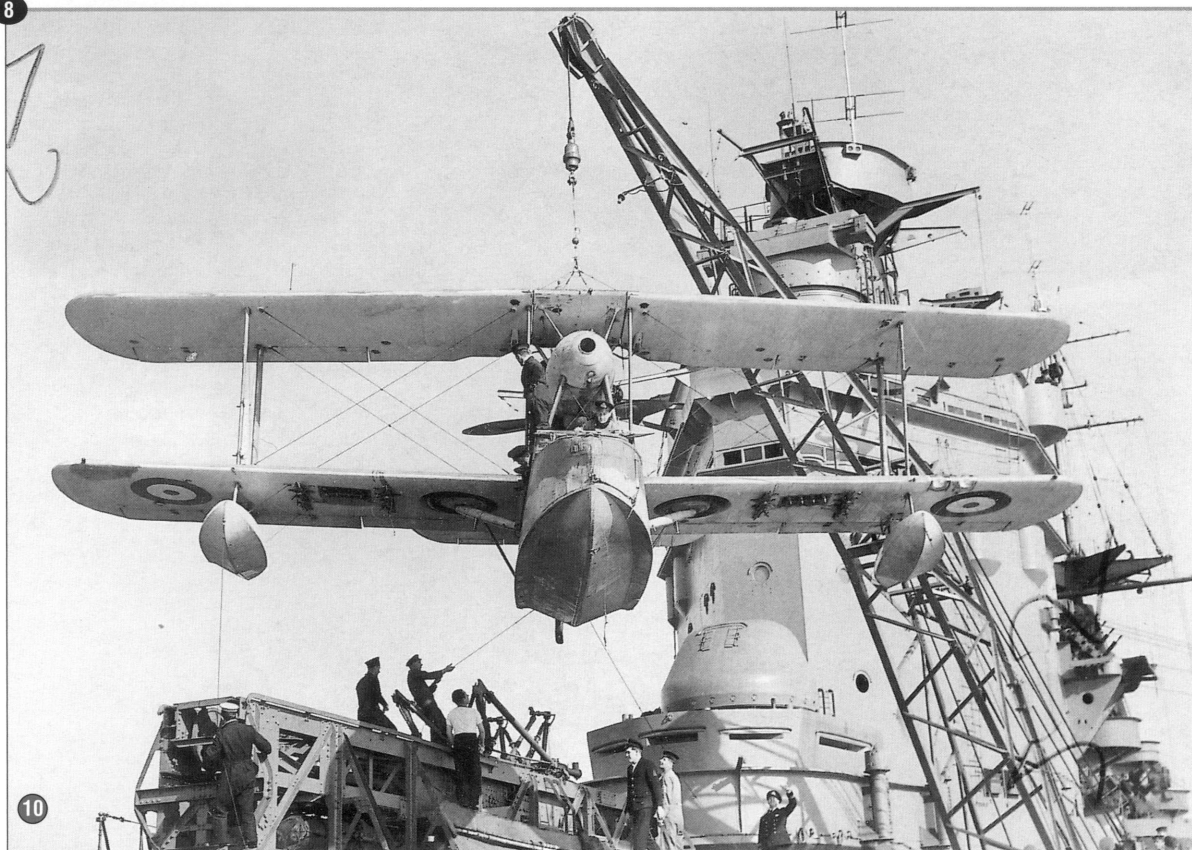
7. A very revealing shot of the underside of the port lower wing shows the wells for the bomb-carrying gear. This was most probably a Walrus I of 701 Sqn FAA on board HMS Argus in 1940. The RAF armourer is fitting one of the two 100lb AS bombs to the Universal Carrier No.1. The Light Series Carrier is empty here



8. Walrus Is of 702 Sqn. FAA on board HMS Argus engaged on anti-submarine patrols in October 1940, note RAF and RN personnel. The nearest Walrus P5659 was delivered in December 1939 and has twin landing lights. Single lights appeared before the war probably with the 'L' series



9. Two Walruses on board HMS Suffolk circa 1941. The far machine 'Just Jake' was named after a character in a regular Daily Mirror cartoon strip of those years. Note the position of the two bow bollards and the cover of the bow cockpit



10. A Walrus I being positioned on the catapult on top of 'C' turret of HMS Rodney 1939/40, this was probably P5649 of 702 Flt. The turret mount was hardly ideal and was removed in 1943. Note the twin landing light which may well have been introduced with the 'P' series

designed to accommodate a Light Series Carrier in a well. This well was flanked by two elongated apertures designed to accommodate a Universal Carrier No.1. The Light Carrier could carry four 8 1/2lb practice bombs but was used to carry smoke floats and later reconnaissance flares. Each Universal Carrier could accommodate a single 100lb Anti-Submarine (AS) Mk 1 bomb and on occasion a 250lb General Purpose (GP) bomb (one under each wing). Eventually the two 100lb AS bombs were replaced by the more effective 250lb Mk IV depth charge. For further information see the Scale Aviation Modeller International issue of January 2001 (Vol.7 Iss.1) for drawings and descriptions of the Light Series and Universal Carriers in the feature 'Swordfish Ordnance'.

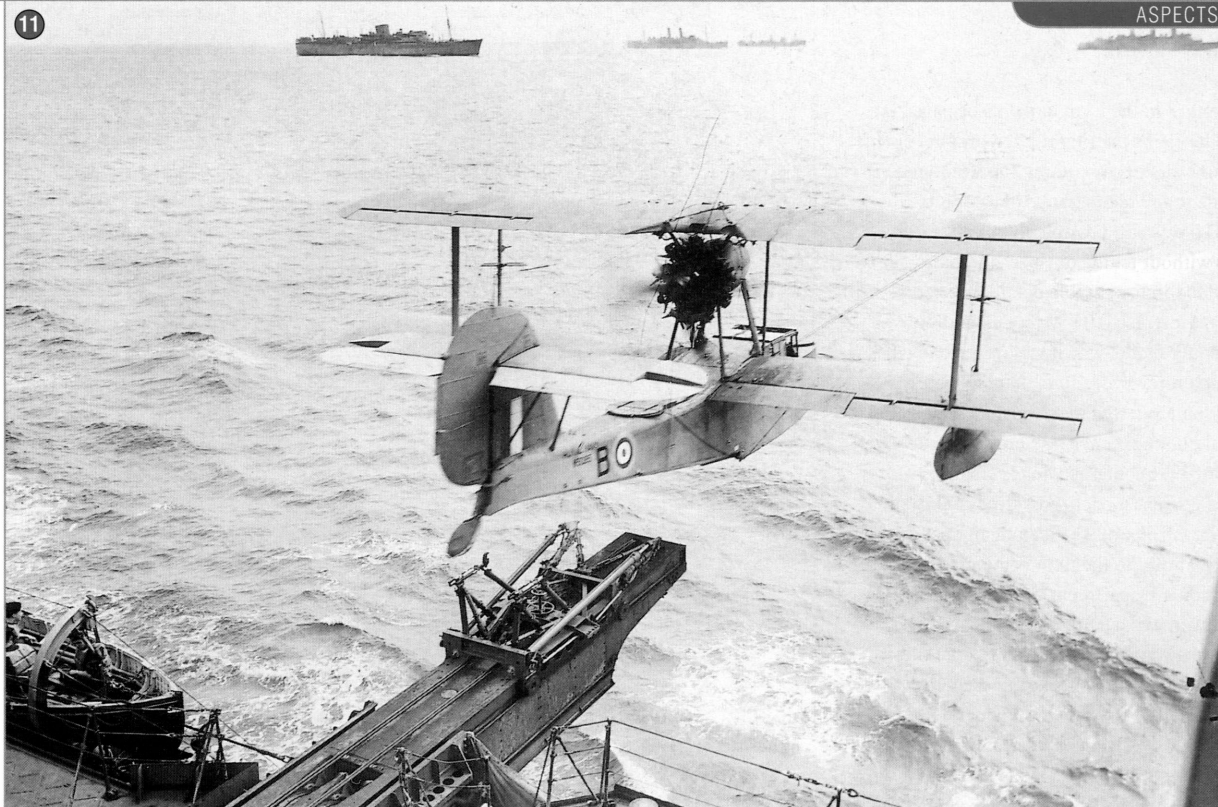
Catapults and the Author's Model

During the later stages of WWI certain capital ships of the Royal Navy were fitted with wooden platforms over one of the main turrets on which was placed an aeroplane, usually a Sopwith Pup, 1 1/2 Strutter or Camel. By turning the turret into the wind the lightly loaded aircraft could take off in a very short distance. The concept of aircraft being carried by the larger warships for gun spotting or reconnaissance was gradually developed, and by the early 1930s catapults of varying types were fitted to several heavy cruisers and battleships which had not been designed for them. The practice was not universally liked in the service for many reasons; the catapults were heavy and not always conveniently situated and aircraft meant tanks of highly inflammable aviation fuel. The aircraft were vulnerable to corrosion and needed protecting covers and were liable to suffer blast damage, apart from being vulnerable even to light fragmentation from an enemy shell. To operate they had to be manhandled and lifted by crane and standby boats had to be manned. Recovery was the worst problem, the floatplanes used were not too seaworthy and with any kind of swell, handling the aircraft could be very difficult even when it alighted on the leeward side of the ship.

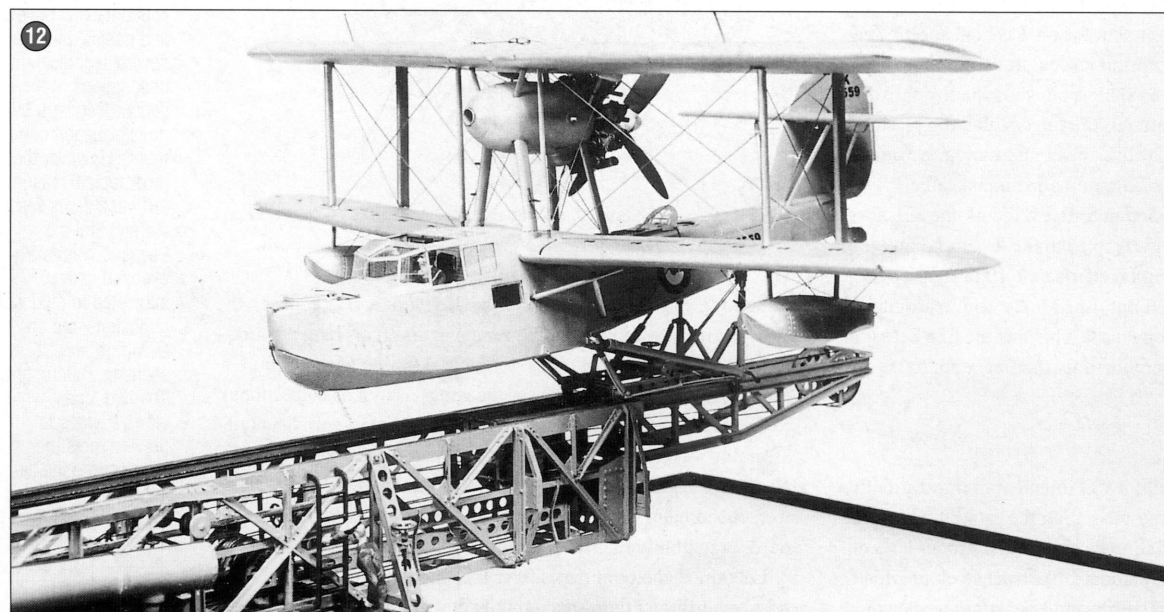
A large number of keels were laid down in the second half of the 1930s and all the new cruisers and the King George V battleship class were designed to incorporate catapults and aircraft accommodation from the beginning. In 1935 a new type

of catapult known as the Double Action Athwartship model appeared; this was fixed to the deck and discharged its aircraft abeam. They were known as the 'D' series, types D1H and DIVH being fitted to cruisers and the D1IH and the D1IHH to battleships. Hangars were placed adjacent to the catapults and could accommodate more than one aircraft. The new catapults were capable of launching an aircraft at a speed of up to 70 knots (80 mph). By 1939 there were three main types of aircraft employed in Catapult Flights. These were the Fairey float-fitted Swordfish, the Fairey Seafox floatplane and the Walrus, the latter outliving the others by far. Catapult operations continued through much of WWII especially during convoy operations, however the introduction of Merchant Aircraft Carriers (MAC ships) and the small escort carrier led to many catapults being removed from cruisers and capital ships by 1942/3. However, the marine catapult is still with us as an essential item of equipment in the form of the powerful carrier launchers of today.

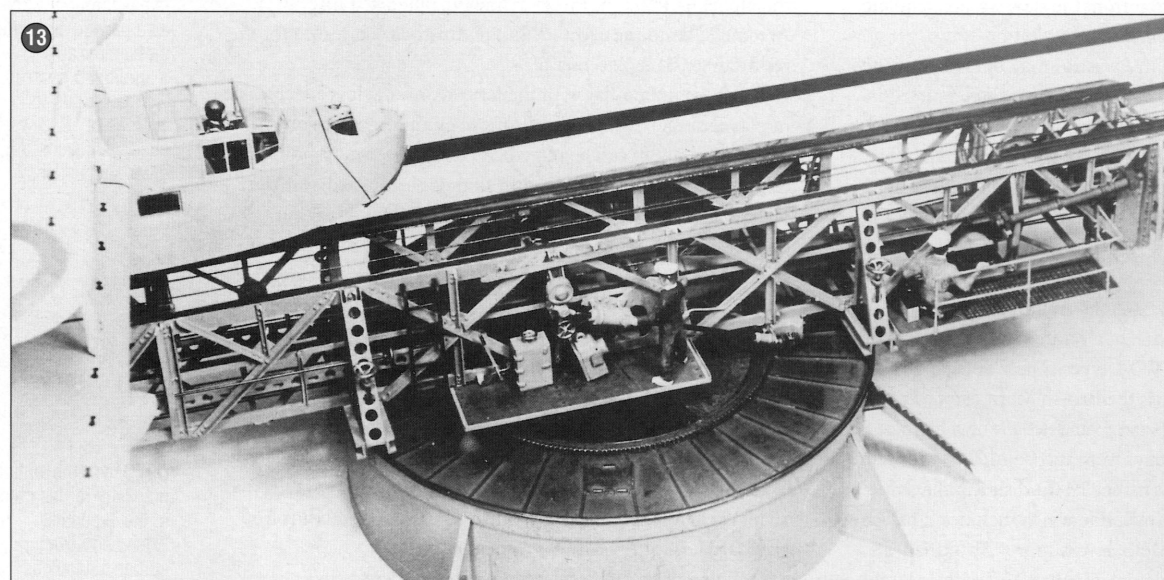
I had always thought that a model of a catapult complete with aircraft would make an interesting subject but it was not until the early 1970s that a medium became available which revived my interest. The medium was 'Plastruct', a well-known product in this country now, but in the 1960s known largely in the USA. I first saw an advert for Plastruct in an American model magazine in October 1969, and wrote to the firm based in Los Angeles and subsequently placed an order for some stock for evaluation. Eventually Plastruct became available here through the agency of EMA Supplies in Feltham. The main problem was the lack of any drawings or firm basic information of what was in fact a complicated structure, and there had been several types of catapult. Extensive research over a number of years resulted in an accumulation of reference material on which to base my working drawings. Information was obtained from a variety of sources including a vital basic dimensioned outline drawing from the firm of Scott McTaggart of Midlothian, Scotland who had been the builders of the type of catapult I had decided upon, the E1IHH cordite-operated model. The type was fitted to several cruisers and another reason for selecting this model was the rich collection of photographic material available. In modelling and draftsmanship, drawings or diagrams are never enough,



11. Walrus II W3085 being launched from the DIH fixed catapult of HMS Mauritius in 1942/3; note the manned ready boat at left



12. The author's model Walrus I on the Type EIIIH Extending Structure cordite catapult built by McTaggart Scott of Loanhead, Midlothian, Scotland. In fact Walrus K8559 was probably never mounted on this type of catapult but that was not known in 1978. Note the seaman on the platform where the cordite charge was fired

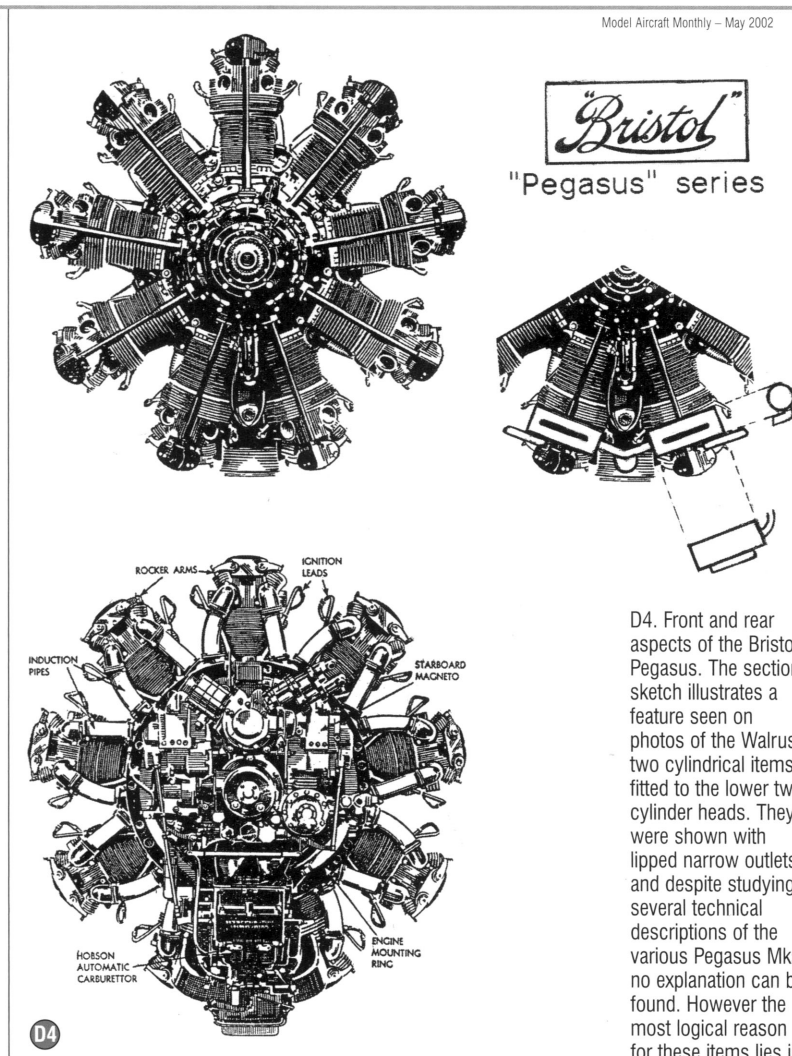


13. A close-up of the central portion of the midstructure. The catapult was revolved mechanically but could be cranked around by two strong men if needed. Note the footprints indicating the safe areas on the wings and the open glasshouse roof

photographic references either in the form of prints or magazine cuttings are essential. In the 1930s the Flight photographer spent some time on board certain warships including the Leander, Neptune and Exeter taking many photographs of catapult activity. In the early 1970s it was still possible to purchase large numbers of 10 X 8 prints without taking out a second mortgage and all this material provided indispensable detail. The actual prototype for the model was a type EIIH 90 foot extending catapult based on the Leander model which was mounted on a drum-shaped base on which it revolved. Total detail of course was not available such as some internal mechanism which was of little importance as it could not be seen. The Aeroplane (the old one) issue of February 25th 1931 contained an excellent feature on catapults and details of current models providing important information. The final lucky strike was the loan of an operating manual for a catapult very similar to the item being modelled from the MOD (Naval Records Department). Above all, this explained how the mechanism worked, for without understanding this the model could not have been made. The final 1/48th scale drawings ran to eight sheets and the item included with this feature is only one, showing a general lateral view. The catapult operated by the firing of a cordite charge which forced a ramhead, at the front of which was attached a set of eight pulleys. These were connected to other pulleys fixed to the extending structures and compensating sheaves so that the trolley carrying the aircraft was shot forward at high speed. The steel cable was actually one continuous length and in the model this meant some 17 feet. It was made from good quality ship model cord which was run through the fingers liberally plastered with a mixture of Humbrol varnish, silver and dark grey which flattened any hairs and produced a well oiled metal cable appearance. This was suspended in a stairwell with the aid of two bemused friends, a heavy nut was fixed to the lower end and the cable allowed to dry overnight. It retained a certain rigidity and any kinks were easily removed but it had to be wound around all the pulleys, a very, very tiresome task. This was the first occasion on which I used the new superglue to fix the final end of the cable.

The Walrus Model

When the catapult was in build it was intended that the aircraft would be a Hawker Osprey, but modelling the catapult absorbed so much time that this idea had to be abandoned. About 90% of the catapult was created from standard Plastruct stock provided free by EMA as they realised that it would be a unique showpiece for their product. The intention from the start was to complete the model for the Model Engineering Exhibition at the beginning of January 1978. Time was running out and I realised that an Osprey built from scratch could never be completed in time. I decided that a Walrus model would suffice and assumed that an existing kit would solve the problem. I realised as always that much remodelling and correction would be required but I miscalculated. The kit which I had bought about twenty years earlier, the Merit 1/48th scale Walrus, had serious flaws. For the younger readers (those under 50) I should explain. One of the first plastic kit manufacturers was the American Aurora company which produced a line of aircraft kits of varying quality and scales including several WWI types. These appeared in the mid 1950s and soon afterwards the British Merit company released several of the Aurora range under their own banner. Some of these rehashed antiques were still being sold within the last few years under different names. Merit decided to enlarge the range by producing their own line which included a fairish Avro 504K, a chunky Tiger Moth, a very lumpy Swordfish, an appalling Bulldog and a crude but acceptable Walrus. I should explain that in this writer's vocabulary 'acceptable' means that



D4. Front and rear aspects of the Bristol Pegasus. The section sketch illustrates a feature seen on photos of the Walrus, two cylindrical items fitted to the lower two cylinder heads. They were shown with lipped narrow outlets and despite studying several technical descriptions of the various Pegasus Mk's. no explanation can be found. However the most logical reason for these items lies in the fact that the Pegasus was totally exposed and subjected to cold wet conditions and on taking off and alighting, much spray. The two 'cans' were either devices to prevent moisture passing into the air intake of the carburettor and/or an old device known as an 'oven'. Hot exhaust omissions were passed through the ovens through which also passed air to the carburettor as a warming up process. German Argus engines of 1913 were fitted with ovens. Any other suggestions?

something can be done with it with hard work. On examining the Walrus kit I realised that much remedial and replacement work would be necessary, including complete skinning of the hull flanks and the upper surfaces of the wings as well as corrections to the under surfaces of the lower wing (see armament). The tail assembly was far too coarse and would have to be replaced as would the engine. The wheels were acceptable but all struts etc. were disposed of. In conclusion, it might have been quicker to have scratchbuilt an Osprey after all.

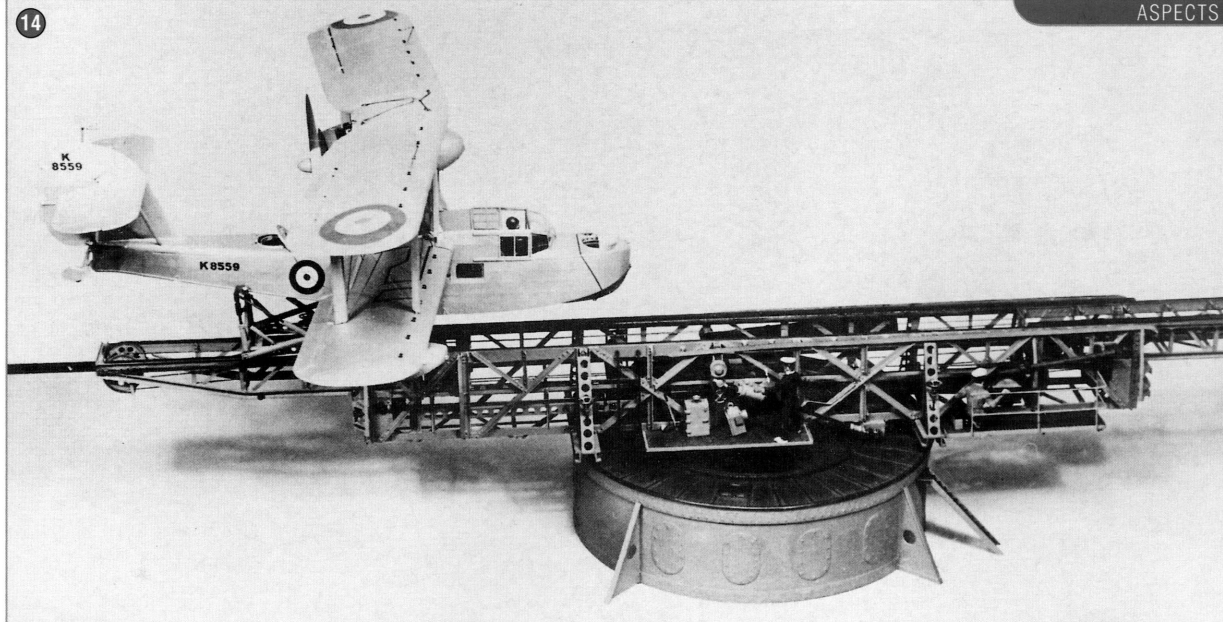
I obtained copies of pages from the Walrus manual which revealed errors in the wing and tail rib structures and noted that the model had been based on a drawing published in Aeromodeller in the early 1950s, and this was one reason for the reskinning and replacement.

For those unfamiliar with the term 'skinning' it is a technique in plastic surgery where a bad surface or an inaccurate one (rib lines for example) can be remedied by scraping and sanding the original down and sticking a thin skin of plastic card over the scraped surface. Scraping not only reduces the original but provides an essential rough surface which is best for adhesion. The plastic card used has to be thin, either 10 or in some cases 5 thou. Extra detail can be added such as correct rib lines and various surface features, even rivets. The skill is in applying the skin without damaging and softening it; very careful application of cement is required and in some cases I have used Humbrol varnish which has a remarkable sticking quality so long as one is prepared to wait. This is only a brief account to explain that the Walrus flanks and top were treated this way and very small 'rivet heads' were applied using a pin in a vice and a guide rule. The original Merit hull had holes instead of rivets.

Skinning of the wing surfaces permitted correct rib lines and of course correct ailerons were separated from the wing and later

D5. One of the author's drawings for his model of the Type EIIH Extending Structure cordite catapult as described in the text.

14

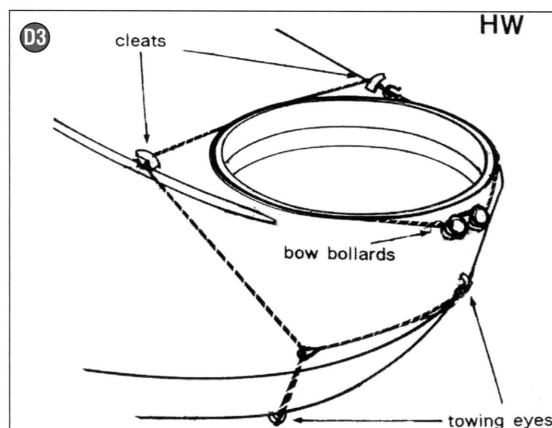
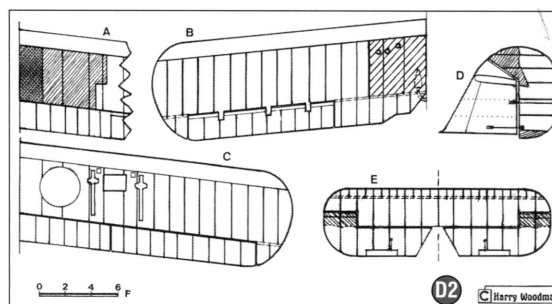
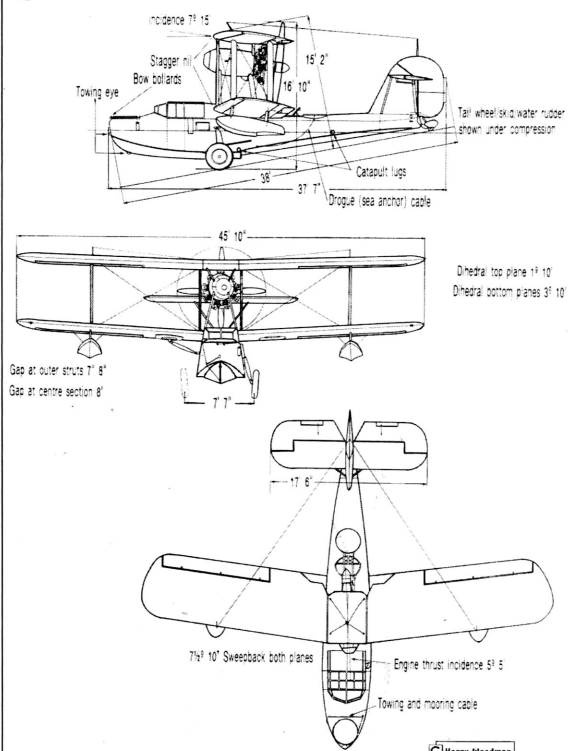


14. Mounted in the position of being drawn back for launch the model Walrus was not too strongly held by the four jaws of the launching trolley. The base was modelled on similar structures on cruisers such as HMS Leander and Exeter

D2. Author's sketches of the flying and tail section showing the position of ribs etc

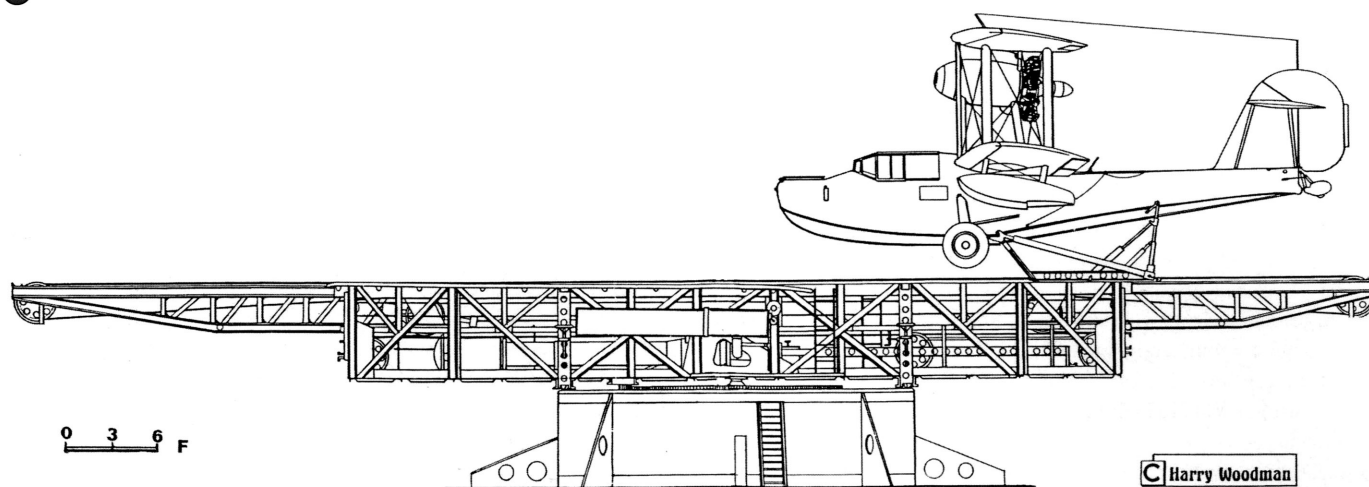
A. The top view of the inboard section of the lower starboard wing; note that all leading edges were plywood covered. The shaded portion indicates a plywood skin over the ribs and like all the other plywood sections, was covered with fabric and rib tapes. The dense section is a metal footplate (one each side). All this reinforcement was necessary for servicing and on occasions, starting the engine with a crank. B. The upper surface of the port upper wing, the shaded area indicating the position of the port fuel tank fitted inside the wing structure. The tank had metal reinforcing strips as shown and was covered with fabric and rib tapes. The sump and fuel line was on the underside and is shown here in dotted lines (see photograph). C. The undersurface of the lower starboard wing showing the positions of the wheel and bomb-carrying gear wells. D. The fin and rudder; the lower part of the fin was constructed as an integral part of the hull and was Alclad covered, the upper triangle was fabric covered. The shaded area of the rudder was plywood reinforced. E. The stabiliser and elevators; the shaded areas were plywood reinforced.

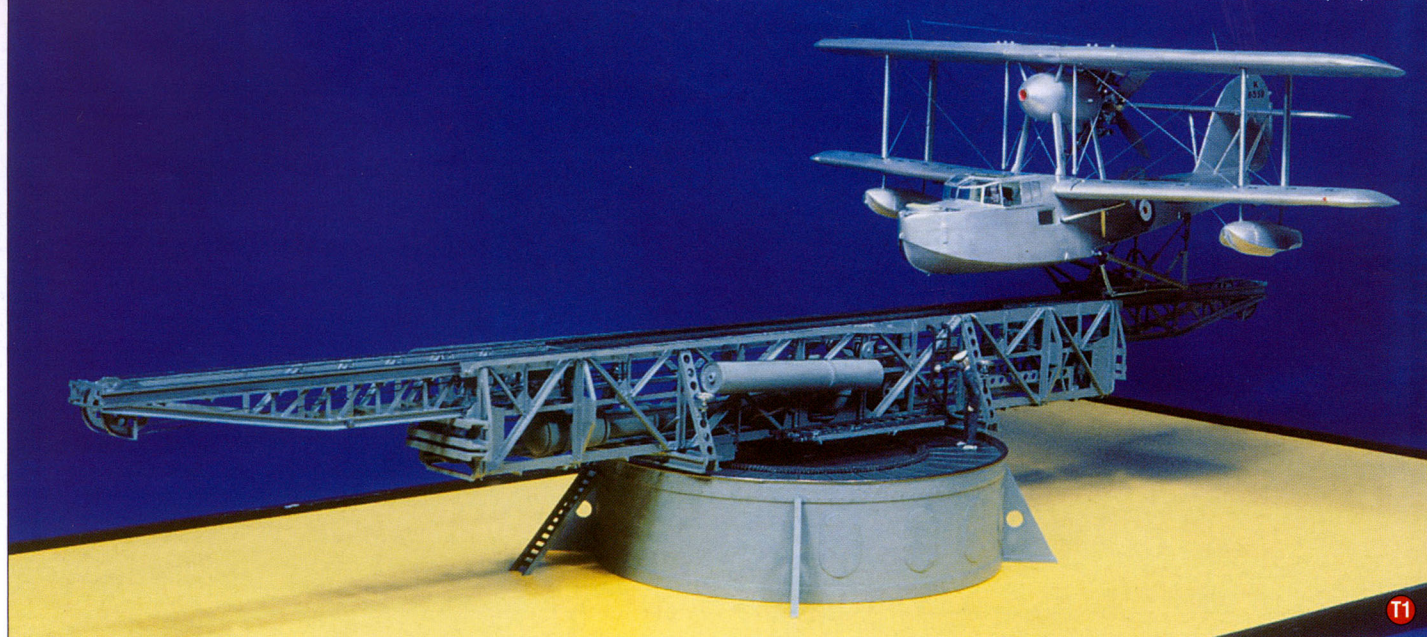
D1 Main dimensions (in feet and inches) extracted from the Air Publication



D3. A rough sketch to illustrate the usual run of the towing line. The bow bollards can be removed from inside the bow cockpit to permit greater freedom for the bow gun if fitted

D5





applied. A new glasshouse was made from acetate sheet folded to shape and the framing was done as this writer's framing is always done, by painting pieces of decal with the appropriate paint and then, after drying, cutting it into fine strips and applying it as appropriate. Nothing can beat this system, as the decal sticks very well and can be moved about whilst still wet. Eventually the Walrus was finished and mounted on the catapult trolley, four jaws holding the catapult spools on the model, not the firmest of mounts but accurate. The Walrus as shown in the photographs is placed as it would be whilst being drawn back to its starting point at the end of the rear extending portion of the catapult. This positioning was done for practical purposes; to mount it at the extreme end would not only present balancing problems but would also make it vulnerable, as the model after all had to be manhandled in its case. Modelled figures were added for effect and it won the 1978 Championship Cup at the MEE. At time of writing two new 1/48th scale kits of the Walrus have been announced, one from Hi-Tech and the other from Classic Airframe. I have seen neither so cannot comment, but sincerely hope that the master modellers did not use the old Aeromodeller drawing which was still being marketed by Nexus until a short time ago.

References

The Walrus has been the subject of many articles in publications over the years and although I have not seen them all, the number which may be available for consultation is still generous. However, two of the best are listed below.

- Profile No. 224: this covers the Walrus and Seagull variants by the authoritative David Brown and appeared in 1972. Profile publications were revolutionary in their day, slim paperback booklets containing a potted history, photographs and air-brushed colour profiles (still a novelty then). They were very reasonably priced and eventually numbered well over 200. Unfortunately the colour work was based on the Aeromodeller drawing mentioned above and depicts incorrect wing and tail rib spacing. Additionally the artist did not understand the bomb-carrying gear on the lower wing and depicts Lewis guns when Vickers 'K' guns would be appropriate.

- Air Enthusiast issues Nos 74 (March/April 98) and 76 (July/August 98). A more recent effort and well covered by Peter London.

It is noticed that many modellers seem to rely on material in the so-called 'Aircraft Encyclopedia' types of publication published over the years. Having knowledge of how some of

these tomes were put together I should advise caution. Similarly with the internet, I have no computer but many of my friends and correspondents in the UK, USA and Australia do. It appears that some of the material available is not entirely reliable and is only as good as the source.

For those interested in British naval aviation of the inter-war period certain Air Britain books are recommended, in particular the splendid Fleet Air Arm Aircraft, Units and Ships 1920 to 1939. This superb volume contains a vast amount of information, statistics and illustrations covering the period. The authors Ray Sturtivant and Dick Cronin, (historians in the fullest sense) have presented a monumental work superior to any produced by commercial publishers. The facts and figures, historical text along with the photographs and 16 pages of colour profiles comprise a treasure trove of information on aircraft and ships. Created and published by enthusiasts (all profits go to Air Britain) the work was published in 1998 and is available from book dealers at £32.50.

Museum Survivors

Survivors is certainly the correct term for the exhibits in the RAF and FAA Museums; their individual histories are long and complex and are here very briefly summarised.

- The FAA Museum at Yeovilton, Somerset: Originally listed as L2301 in a batch built in 1939 this Walrus was sold to the Irish Army Air Corps becoming N.18. It was later acquired by Aer Lingus as EI-ACC and subsequently EI-AIZG. In 1963 the Walrus was found in a scrapyard at Thame, Oxfordshire and rescued by the Historic Aircraft Preservation Society for £5 and handed over to the FAA Museum. It was restored by the RN Engineering College at Arbroath and repainted as L2301, the Museum accepting it in December 1966.

- The RAF Museum at Hendon, North London:

In fact this specimen is not a Walrus but a Seagull V. Built at Woolston in 1936 it was handed over at Point Cook and eventually served on board HMAS Australia and Sydney. After severe damage and 18 months under water it was repaired and served on board HMAS Perth in 1940. In December 1941 it was taken in hand by Qantas for servicing and overhaul and in 1945 was placed in storage. By 1946 it was in a derelict state under the registration VH-ALB and was eventually acquired by the RAF Museum in 1973. After a complete restoration at RAF Wyton it was handed over to the RAFM in 1979, and now resides in the Battle of Britain Museum under its original serial A2-4.

MAM

T1. The author's model of a Walrus I on a catapult built for the 1978 Model Engineering Exhibition when it won the Championship Cup. The catapult was really a showpiece for Plastruct (Photo by Ron Moulton)



Kbely Jets

By Jim Grant

The Museum Letectvi Kbely is located on the outskirts of Prague, Czech Republic, and is easy to get to by public transport. The museum was the product of the former Communist government which ensured that examples of prototypes, aircraft coming out of service with the air force, government organisations and surviving aircraft from the 1920s and 1930s were brought together. Replicas of significant aircraft from the past which did not survive the Nazi era were built to fill the gaps. With such a wealth of material available it is not surprising that this is one of the great museums of Europe and that it possesses many unique types of aircraft.

This feature looks at the jet-powered fighter aircraft which

form an interesting sub-section of the displays. These emanate mostly from the former Soviet Union but also include Czech-built Messerschmitt Me 262s, a Northrop F-5, a McDonnell F-4, a Gloster Meteor and a Commonwealth Aircraft Corporation Sabre. The last four seem out of place but I was told that they were there to represent aircraft which Communist forces have fought against.

Czechoslovakian fighter aircraft were usually left in a bare metal finish or with the upper surfaces painted in the standard Soviet drab green. However with the country's newly found independence fighters began to carry colourful unit markings. A perusal of *Flypast*, *Air Force Monthly*, *Air Power* and the small specialised publications over the past decade will turn up a number of interesting colour schemes. **MAM**

1. MiG-15UTI, 2626, one of four at the museum. Czechoslovakian production of MiG fighters began with the MiG-15 in 1953 and continued with MiG-17s in 1955 and MiG-19s in 1957

2. MiG-21MF, 2410. This type is one of the most important types in the Czechoslovakian Air Force, and twenty-one variants of the type are on display or parked around the airfield. The CAF operated F, F-13, MF, PF, PMF, R U and US sub-types





3. Sukhoi Su-7U, 1017. Close-up these aircraft are big and crude with none of the refinements expected on Western fighters of the era



4. MiG-23BN, 9831. The Czechs also operated the MF and SB sub types. With their multi-coloured camouflage scheme they are the most attractive of the fighters on display



5. Yakovlev Ya-15, 30. This was a trials aircraft. It was the only one operated by the Czechoslovakian Air Force but it was rejected in favour of the Yak-23. It is indicative of the nation's collecting policy that it was saved from destruction

6. Northrop F-5 in the colours of the Vietnamese Air Force. This was a gift from one Communist brother to another



7. Avia S.92 (Messerschmitt Me 262A) Czechoslovakia built between twelve and seventeen single and two-seat versions of these aircraft (depending on the source of information) on a production line set up in 1944. They served with the 5th Fighter Squadron where they remained in service until at least May 1951



8. Yakovlev Yak-23, HX-51. The Czech Air Force operated a single squadron of this type alongside the Avia S.92 and CS.92. It was an interim type which was soon replaced by the MiG-15





9. McDonnell FGR.2 Phantom acquired from the United Kingdom, still in its commemorative colour scheme

10. Gloster Meteor F.8 in the markings of the Royal Belgian Air Force, one of the few Western aircraft in the museum

11. MiG-15



RNZAF Kittyhawks

COLOUR SCHEMES & MARKINGS, PT.3

by Ian K. Baker

Codes, Theatre Markings & Serials Fuselage Codes

Use of RAF-style three-letter codes in light grey (yellow has also been mentioned) was adopted for operational aircraft during 1942.

However, in 1943 the use of such codes became limited to home-based aircraft. The reason for this was that during 1943 the RNZAF dispensed with the organisational system of land-based squadrons being more-or-less self-contained operating units. The new system was one in which aircraft were allocated to servicing units (SUs) based in forward areas. Aircrew continued to be teamed in squadrons, and they would rotate through forward areas in tours of six to eight weeks. The SU in their area was responsible for the provision of airworthy aircraft, so squadrons did not have 'their' aircraft. Individual aircraft identities were generally indicated by a letter or number carried on either side of the nose &/or fin, allocated by the SU.

Operational-type aircraft of home-based units could still be seen wearing codes. Some units appear to have chosen to apply their codes in a distinctive colour such as yellow (No.1 OTU), red

(No.4 OTU) or blue (No.2 OTU). There must have been a requirement for unit letters to be placed forward of the roundel on both sides of the fuselage, as photo evidence shows this to have been a very consistent practice, right from the start.

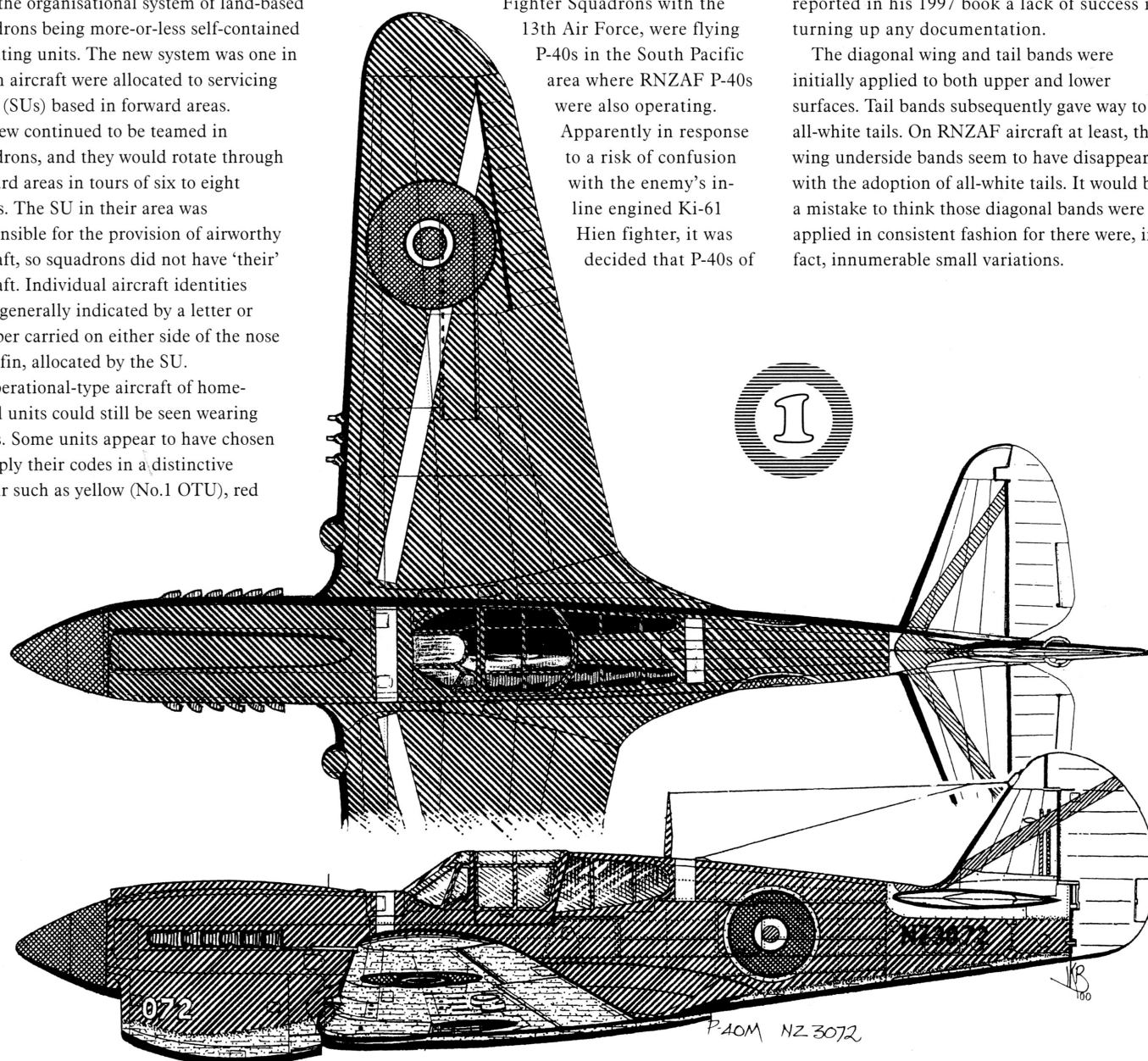
White Theatre Markings

The USAAF 44th and 68th Fighter Squadrons with the 13th Air Force, were flying P-40s in the South Pacific area where RNZAF P-40s were also operating.

Apparently in response to a risk of confusion with the enemy's in-line engined Ki-61 Hien fighter, it was decided that P-40s of

both air forces should wear special markings which would consist of white bands over the fuselage fore and aft of the cockpit and diagonally across wing and tail surfaces. These markings were introduced around March-April 1943 and persisted until P-40s disappeared from the scene. Unfortunately little appears to be known about the origins of this marking: Aviation historian Dana Bell reported in his 1997 book a lack of success in turning up any documentation.

The diagonal wing and tail bands were initially applied to both upper and lower surfaces. Tail bands subsequently gave way to all-white tails. On RNZAF aircraft at least, the wing underside bands seem to have disappeared with the adoption of all-white tails. It would be a mistake to think those diagonal bands were applied in consistent fashion for there were, in fact, innumerable small variations.



Serials

Serials of RNZAF aircraft were prefixed by the letters NZ. There was usually no hyphen between the NZ and the three- or four-digit serial number which followed, although sometimes a small space was left. Generally there was consistent spacing between each element of the serial from beginning to end, as with RAF serials. Serial numbers were issued in type-linked blocks of sequential runs, RNZAF P-40 Kittyhawk serials running from NZ3001 to NZ3293. These serials were applied in black, typically beneath the tailplane.

Modellers should remember that Lend-Lease aircraft were built ostensibly for US air forces, with whom they had a serialized identity, although they were to be allocated in batches to an overseas recipient. This would be the reason why many of New Zealand's P-40s may have arrived either marked-up and serialized for the RAF (who redirected them) or in other instances carrying regular USAAF serialing together with star insignia, all of which had to be painted out. Traces of this painting-out with NZ colours would certainly have been part of the appearance of many aircraft until such time as they were completely repainted.

The Drawings

The base drawings prepared for this article owe much to reference artwork by Don Greer, Egidio Imperi, G.R.Duval, & William Wylam.

Camouflage & markings details have been delineated with great care after very close study of various photographic references.

Drawing 1:

P-40M, NZ3072 (built as 43-5505), coded 072 (ex-'Wairarapa Wildcat'), now with No.4 OTU, as it appeared when at Wigram Air Display September 1944.

When RNZAF combat aircraft returned or retired from war zone Maintenance Units back to New Zealand, their overhaul included a repaint, usually much-needed. As described in Part One, all indications point to a repaint policy of recreating the original scheme using RNZAF colours, some of which were supplied from Australia. So here is

NZ3072, originally Dark Olive Drab, no doubt with Medium Green 'splotches', and Neutral Gray undersides, repainted Foliage Green, with greenish grey undersides which just might have been a NZ or Australian version of the MAP colour Light Slate Grey.

Repaints of some ex-combat aircraft even included theatre markings along with roundels much like those they had worn previously, presumably as a kind of celebration of past achievements. Blue-white-blue roundels were re-applied on wing topsides, and presumably (but not known for sure) on undersides also, but fuselage roundels frequently regained red centres, although by this time the NZ roundels on aircraft in combat zones had long since included white bars, and barred roundels always had blue centres. The white bands had been returned, albeit in slightly abbreviated form, and were almost certainly not carried on undersides. The white tail was also returned, but now with handsome red bands across it for added decoration.

Although NZ3072 has been described as 'New Zealand's best known Kittyhawk' once having had the Wairarapa Wild Cat, an angry black cat, proudly emblazoned on its nose when operational, along with eleven victory flags, these markings were apparently lost with the repaint, along with the code number 19, probably in black, which was replaced by the last digits of its serial number, trainer style, these being shown in white.

You should note that this particular aircraft has taken on at least two different guises in recent times, at the hands of two able illustrators, and that I must admit to having reservations about both portrayals. The unlikely notion of white bands being red-outlined in a combat theatre has been resurrected in a popular US publication's illustration of NZ3072, whilst in a fairly recent British magazine the colours and markings of Wairarapa Wild Cat's second, more peaceful, life (the one illustrated here) appear to have become confused with its combat days. Additionally, one has the aircraft's code number 19 in black, the other in red, and they do not even agree with each other regarding the arrangement of the victory markings. Very confusing!

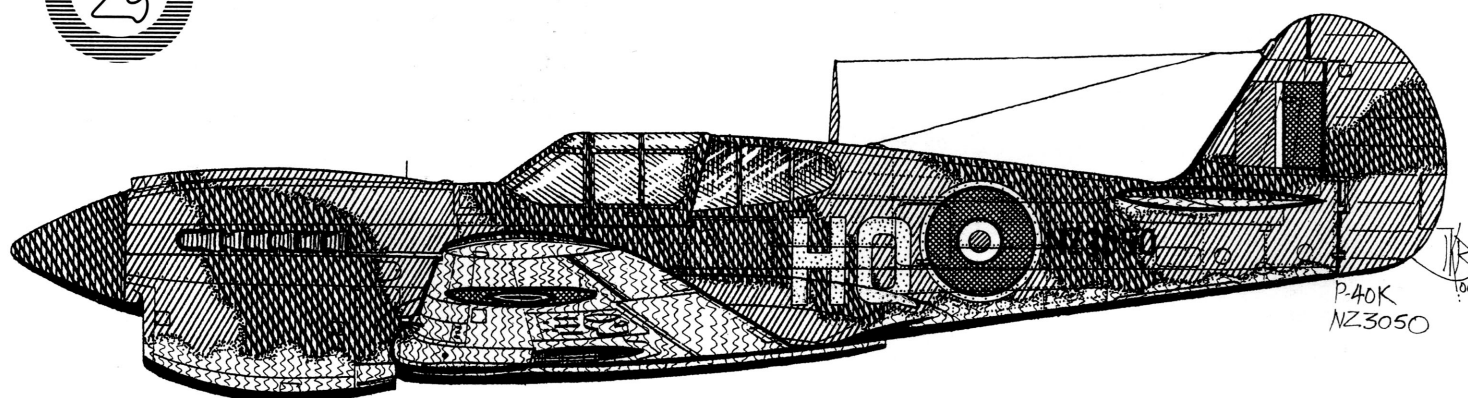
Drawing 2:

P-40K, NZ3050 (built as 42-10162), coded HQ•(?), as seen when flying with the Gunnery Training School, date uncertain.

When you see a P-40 showing a wavy separation between upper and lower camouflage, you can be sure that you are looking at a repaint job. As if that were not enough, on this example the contours of the upper camouflage pattern follow those of the original Curtiss one only loosely, the two colours meeting much more softly, with a degree of feathering, a sure sign of a repaint job.

NZ3050 has been retired from front line duties and repainted. Its markings confirm new duties in home skies: the broad 'C-type' fin stripes, the retention of red centres in fuselage roundels and the application of codes, albeit without an individual identity letter which may yet be added. Obscured by shadow and angle in reference material, we can only assume that wing roundels continued to be the blue-white-blue style usually retained by combat types at that time, even when retired and sharing the skies with other RNZAF training and communications aircraft wearing RAF-style 'B-type' and 'C-type' wing roundels.

Now to the question of the camouflage colours. The only RNZAF camouflage which did not echo a US or British one was that created by the decision to replace Dark Earth with the blue-grey Ocean Blue when teamed with Dark Green/Foliage Green in the two-colour disruptive scheme, as described in Part One. Combined with undersides given the local light blue-green colour believed to have been known as Duck Egg Blue, which was appreciably stronger in colour and somewhat darker in tone than the MAP colour Sky, a camouflage scheme resulted which was not only well suited to sea, sky, lush land and many weathers, but also quite unlike any other in appearance. Admittedly there is a possibility that NZ3050's DuPont Dark Earth areas were repainted with a brown again, but we shall probably never know with absolute certainty that this was not the case. However, authoritative information points to the substitution of Dark Earth with Ocean Blue being a general one.



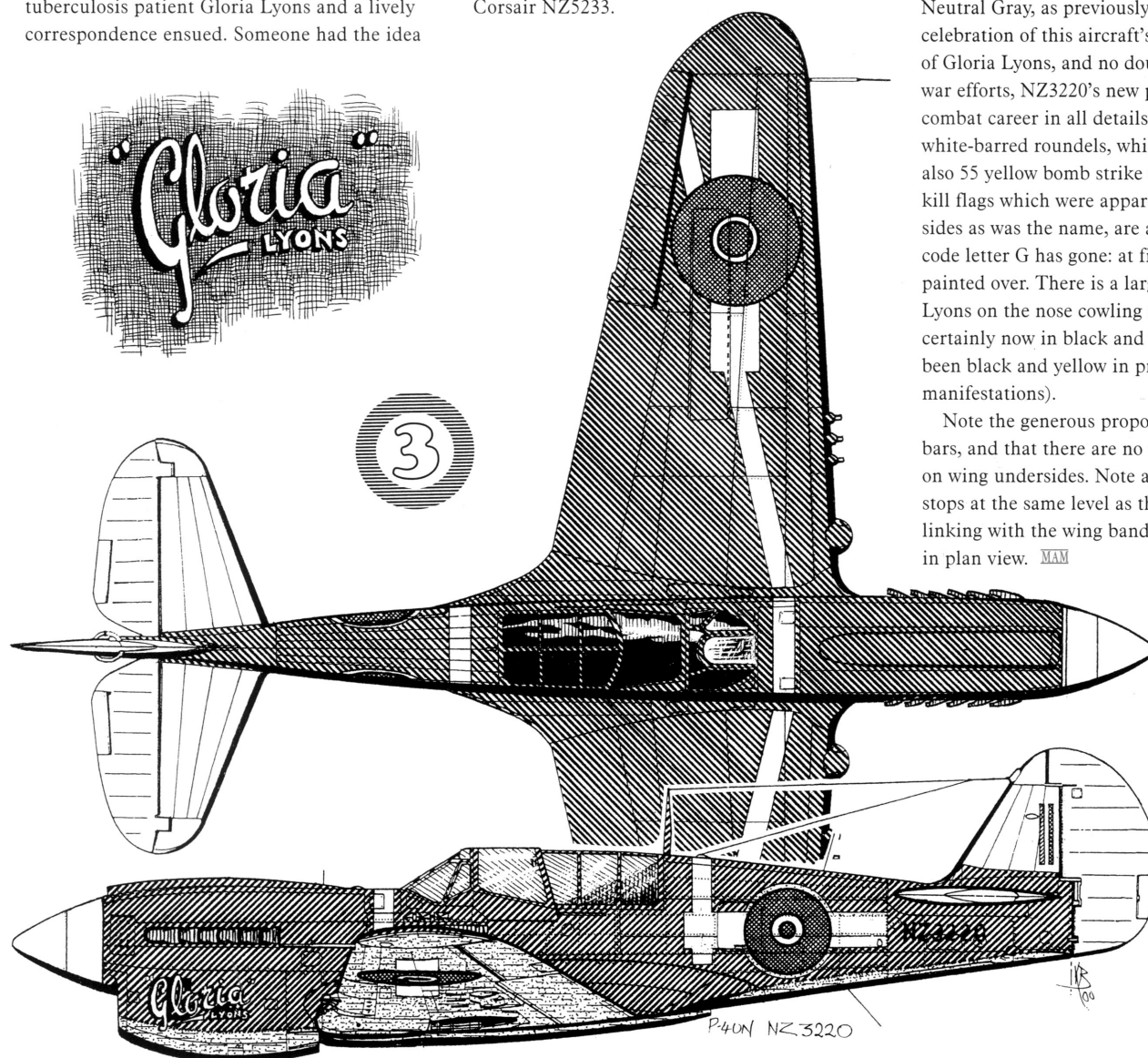
Drawing 3:

P-40N, NZ3220 (43--22962), 'Gloria Lyons'. Dr. Charles Darby in his book 'RNZAF, The First Decade 1937-46' tells us that in December 1943 two airmen with 4 SU in New Georgia advertised for pen friends in a New Zealand newspaper. One reply was from hospitalised tuberculosis patient Gloria Lyons and a lively correspondence ensued. Someone had the idea

of naming P-40 NZ3148, code letter G, after Gloria and 'adopting' her for a 4 SU 'mascot'. NZ3148 was lost, so the name and code letter were transferred to NZ3188 which was also lost, and so NZ3220 became Gloria Lyons. Fourth and last to carry the name was a short-lived Corsair NZ5233.

Having served its time in the front line, NZ3220 was returned to New Zealand and given a repaint. Or maybe the other way around, as the 4 MU assigned code G was initially there but has subsequently been removed. Anyway this repaint was in Foliage Green with undersides given the grey-green used to replace Neutral Gray, as previously described. In celebration of this aircraft's achievements, and of Gloria Lyons, and no doubt of the RNZAF's war efforts, NZ3220's new paint job recalled its combat career in all details. The white bands, white-barred roundels, white tail and spinner, also 55 yellow bomb strike symbols and 2 1/2 kill flags which were apparently carried on both sides as was the name, are all there. Only the code letter G has gone: at first there, then painted over. There is a larger-than-ever Gloria Lyons on the nose cowling sides, almost certainly now in black and white (it may have been black and yellow in previous manifestations).

Note the generous proportions of the white bars, and that there are no white theatre bands on wing undersides. Note also the nose band stops at the same level as the aft band, not linking with the wing bands although they align in plan view. [MAM](#)



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Close-up of the nose
of the EF-111A

Aardvarks and Electric Foxes

by Mike Ingram

Although the F-111 first achieved its place in history as the first production variable-geometry or 'swing wing' aircraft, it was not until 1986 that it had its brief moment of fame as the aircraft that bombed Libya. Twenty-six years after its first flight, the F-111 or Aardvark as it is colloquially known, is still NATO's main long range strike aircraft. Its sister aircraft the EF-111A Raven (or Electric Fox) is the only dedicated electronic warfare aircraft in service with NATO.

The history of the F-111 can be traced back to 1960 when the United States Airforce called for an aircraft that not only could carry out conventional and nuclear strike but also air superiority and reconnaissance missions. After lengthy studies and considerable political to-ing and fro-ing, the contract for 24 development F-111s was awarded to General Dynamics, 18 as the F-111A for the USAF and five F-111Bs for the US Navy. The latter were the responsibility of Grumman, the programme eventually collapsing under the weight of problems that beset it.

It was not until 1967 that the F-111A finally achieved operational status when the first production models were delivered to 474th Tactical Fighter Wing at Cannon Airforce

Base. Today there are five different models in service with the USAF. As well as the F-111As which are attached to 366th Tactical Fighter Wing (TFW) and the FB-111As that are with the 308th and 509th Bomb Wings, there are F-111Es with the 20th TFW at RAF Upper Heyford, F's with the 48th TFW at RAF Lakenheath and 57th TFW at McClellan AFB, California, while the 'D' version is based with the 27th TFW at Cannon AFB. The F-111 has also been exported to Australia in the F-111C and RF-111C versions.

Whatever the version, the basic design of the Aardvark remains the same. One of the most prominent features of the F-111 is the giant elongated and hinged nose that houses the aircraft's main and Terrain Following Radar (TFR).

The heavy weight of the avionics and stores needs heavy duty landing gear, and directly below the cockpit is the aircraft's twin-wheeled nose landing gear, which retracts forwards pulling the twin doors closed behind it. The main landing gear meanwhile pivots near the aircraft's centre line and opens out from its fuselage bay, with massive low pressure tyres on the end of long-stroke legs. This enables no-flare landings with out the crew noticing the touchdown even with heavy loads. The



Paveway II laser guided bombs on an F-111A



Weapons of the F-111



Close-up of the cockpit

As well as bombs
F-111s carry
Sidewinders for self
defence



landing gear doors open along the Aardvark's centre line, the forward door operating as a giant airbrake. Underneath the tail there is also a tail bumper, made from steel, which protects the tail when taking off and landing. Sprung by a shock-strut, it is retracted into the fuselage during flight.

Between both sets of landing gear is the aircraft's internal weapons bay. Depending on the version it can carry four thermonuclear freefall bombs (E), two AGM-69A attack missiles (FB-111A), a reconnaissance pack (RF-111A), a M61 rotary cannon on the right hand side only (D) or the Pavé Tack laser designator pod semi-recessed into the E versions. This useful add-on combines a laser with a Forward Looking Infra-Red sensor in a powered turret, both boresighted; they give clear, magnified pictures of the target in the cockpit, from which they can designate the target by laser.

On top of the aircraft are the variable-geometry wings that can sweep from their minimum of 16 degrees (for low speeds) to the maximum of 72.5 degrees (supersonic flight) in 24 seconds. These are attached to fuselage via small fixed inner wings; at their junction they have forward facing wing gloves.

View of the tail



These are small triangular surfaces that can pivot through 90 degrees to improve airflow over the junction.

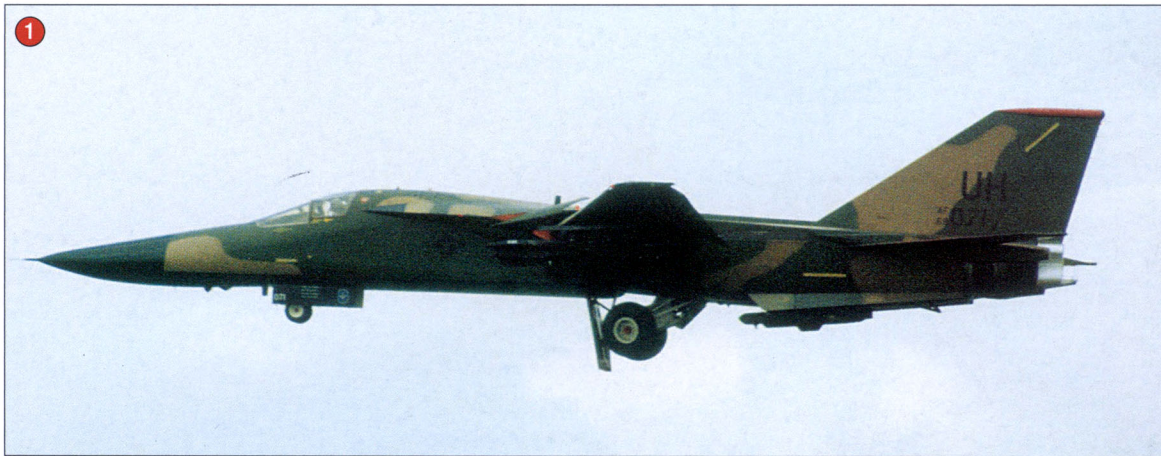
The wingspan of the F-111 varies with the model, A, D, E and F versions have a fully spread span of 19.2m and 9.74m swept while the FB models are 21.33m and 10.33m respectively. Along their leading edges are slats that act like mini-wings which at low speeds are extended forwards to increase lift and help prevent stalling. The trailing edges have double-slotted flaps running along their entire length. On top of the wings are pivoted airbrake spoiler surfaces that aid roll control, and underneath are two pivoting pylons per wing that can carry the various different weapons available. There is also provision for two fixed pylons on each of the outer wings.

The types of weapon carried on the pylons depends on the role but typical weapons can include Mk 82 Snakeye iron bombs, GBU-10 or 15 and Paveway II laser guided 'smart' bombs, Mk 83 General purpose bombs, AGM-69A short range attack missiles ('A' version only) or AGM-109 'Tomahawk' cruise missiles. The F-111 can also carry jammer pods such as the ALQ-119 (V) or ALQ-131 as well as 500 gal drop tanks.

At the wing roots are the aircraft's massive engines. These too vary with model, the most powerful being the TF30-P-100 afterburning turbofans that are fitted to the 'F' versions, all others being variants of the same TF-30-P series. At the front of each engine is a curved-bodied air intake with splitter plates and a ring of auxiliary inlets just behind the main inlet give the extra airflow required for take off. Each of these inlets is fitted with spring-loaded suck-in doors for when they are not in operation.

Running down the cowlings are ventral fins to aid stability, while at the rear are the engine nozzles. These are fully variable and have the unusual feature of translating tailfeathers that can move to the rear for take-off.

On the rear of the tailplanes which act as giant hydraulically driven stabilizers are tiny aerials that are part of the F-111's radar warning system that works in conjunction with the infra-red warning system. The latter gives warning of approaching missiles and aircraft, the receiver being a large tube on top of the tail fin. With only one or two exceptions on US F-111s these are usually painted in different colours or patterns for each



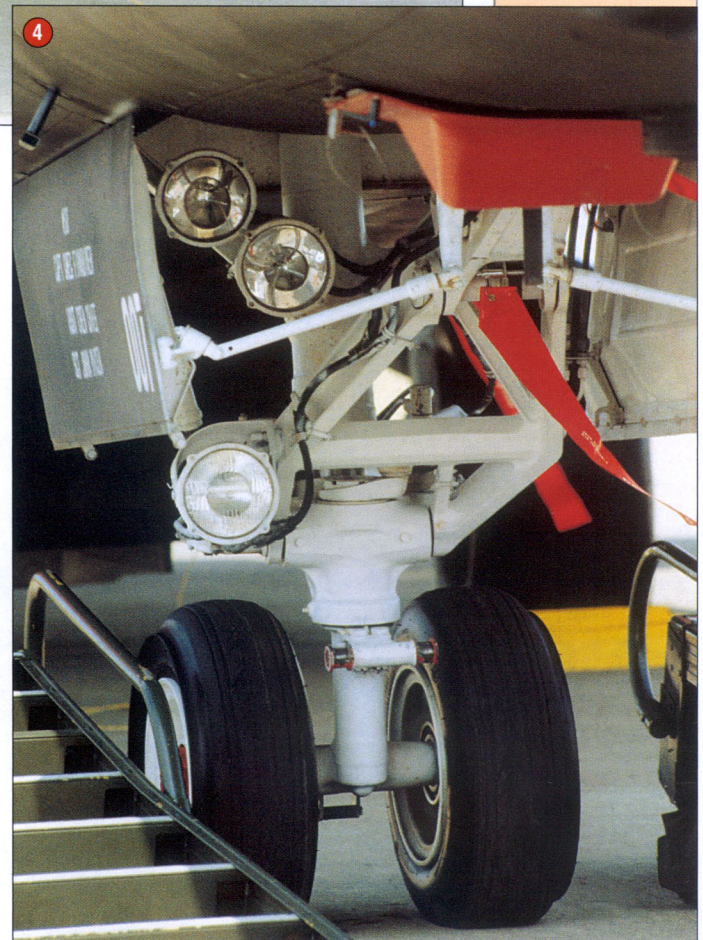
1. An F-111 coming into land



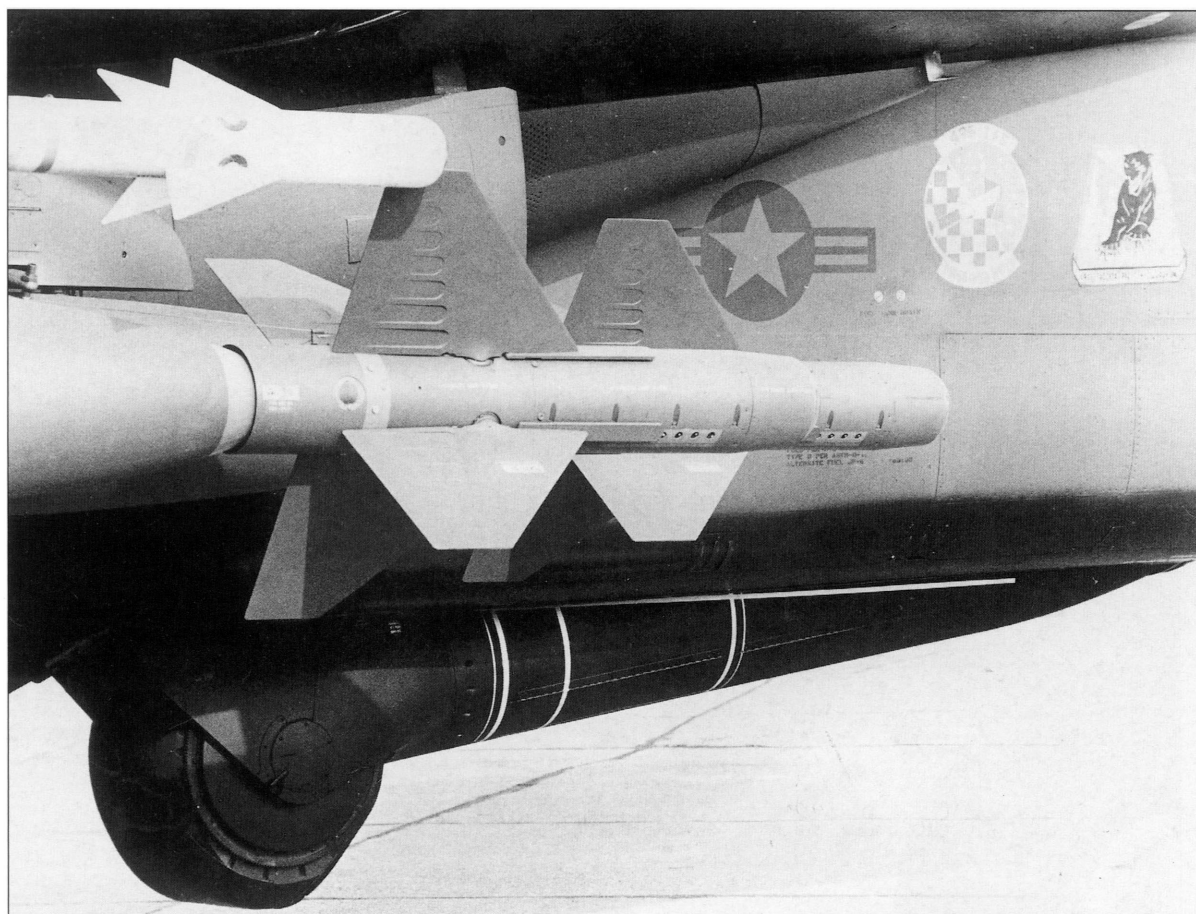
2. Close-up of the main undercarriage



3. An F-111 takes off from Upper Heyford



4. Front twin wheel on the F-111

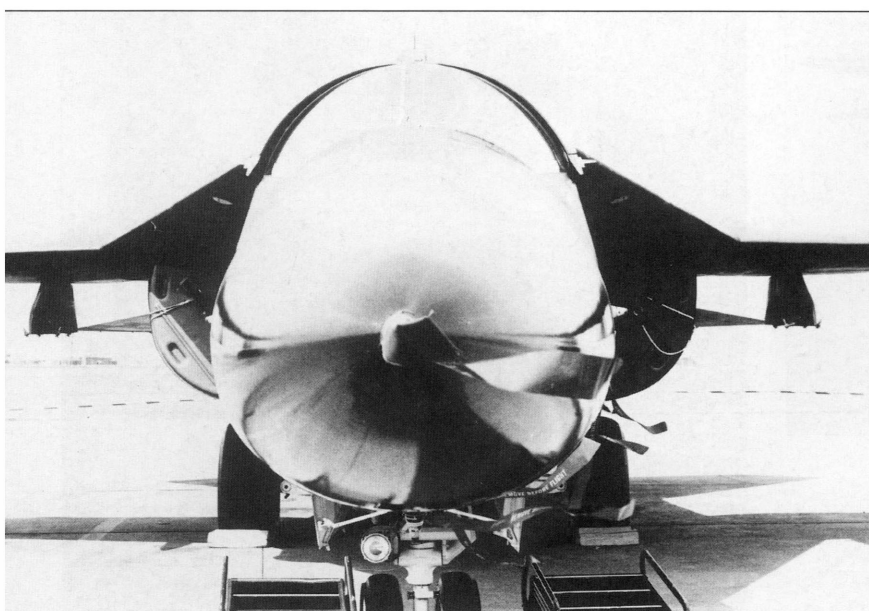


A 48th TFW's AVQ-26 Pave Tack pod along with the noses of a pair of Paveway bombs.

squadron, such as red for the 494th TFS from Lakenheath or tiger stripes for 79th TFS from Upper Heyford. The exceptions usually have bands of colour directly below the fin tip.

The exact type of main radar depends on the version; the APQ-113 is fitted in the nose of the F-111A, C and E and is used for navigation, air/ground ranging and weapon delivery. Bomber variants of the F-111A are fitted with a version of the APQ-113 called the APQ-114 which has a beacon mode, north-orientated display and photo recording as extras. 'D' versions are fitted with the more advanced APQ-130 and is the same as the aforementioned, with the addition of Doppler beam sharpening, illumination for air to air missiles and a Moving Target Illuminator that can eliminate all radar returns except those that are moving. F-111Fs are fitted with APQ-144s.

Front view of the F-111



To penetrate hostile airspace the Aardvark flies fast and low; to enable it to do this an important part of its avionics is the TFR which is next to the main radar. The usual type fitted is the APQ-110 or -146, both allowing the aircraft to fly as low as 2000ft, hugging the contours of the land in any type of weather.

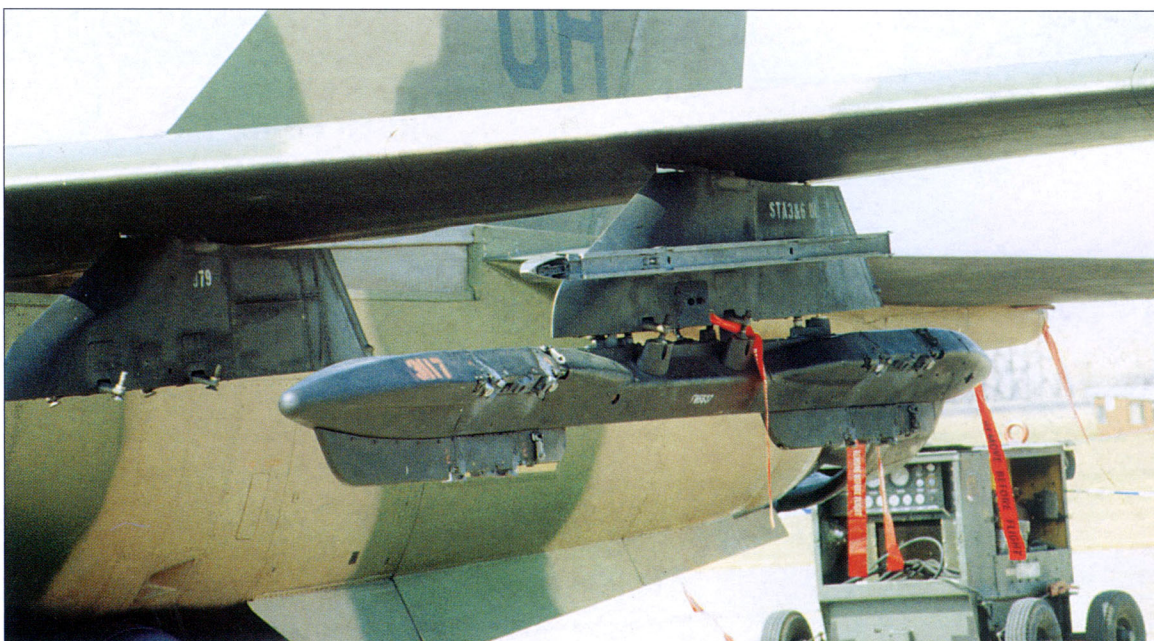
Other features of the aircraft's impressive avionics suite include an automatic Identification Friend or Foe system, Tactical Air Navigation system with small aeriels behind the cockpit and under the nose, a Radar Homing And Warning System with Radar Warning Receivers mounted in pods along side the engines and a jammer pod hung externally between the ventral fins. Underneath and almost directly below the front of the cockpit is the group of small bladed aeriels that serve the UHF communications and the radar warning receiver.

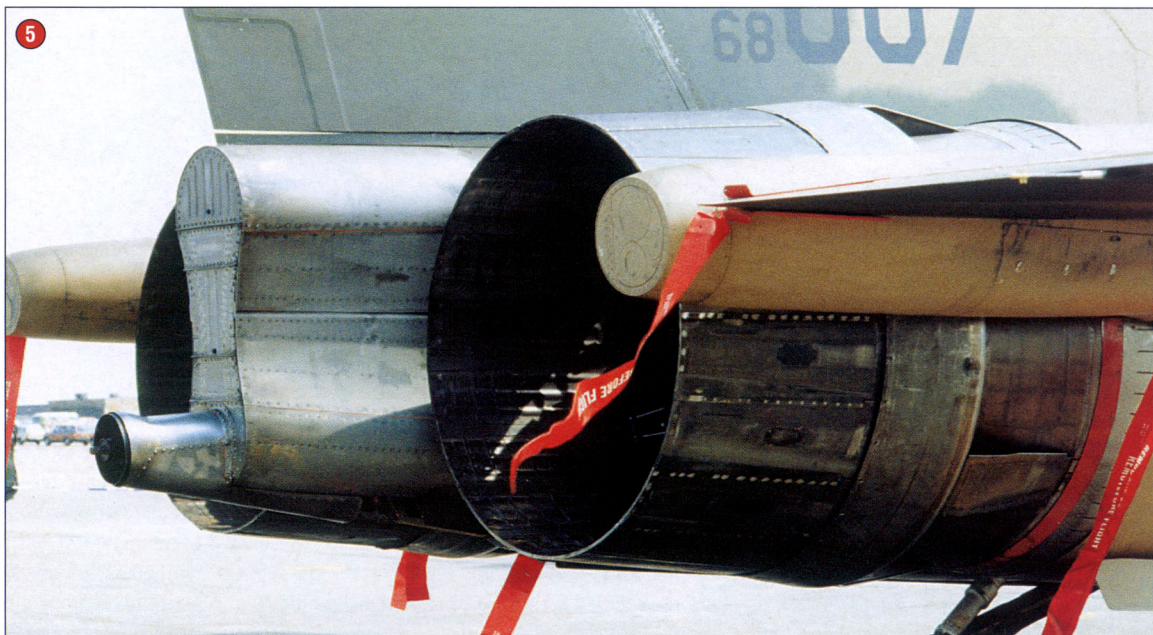
All the information from the avionics is displayed in the two-seat, side-by-side cockpit, the navigator also acting as weapons operator. The cockpit itself also doubles up as a self-contained escape capsule and survival shelter. In event of emergency the whole cockpit can be ejected, a miniature detonating cord around the capsule cutting it free from the fuselage and a guillotine serving any electrical and mechanical connections before it is ejected by rocket motors. Parachutes then allow the capsule to safely descend, acting as a survival shelter on land or sea until rescue. In case of heavy seas, the pilot's control column also doubles up as a handle for an integral bilge pump.

While the EF-111A Raven has the unmistakable shape of the Aardvark, its role is completely different. Designed to counter the threat from almost every conceivable radar source, whether it be anti-aircraft artillery or sophisticated air to air missiles, the Raven can carry out three different basic types of mission. In its Electronic Warfare (EW) support role the EF-111A flies at high altitude around 62 miles behind the attacking force, monitoring and countering emissions and threats, especially from hostile aircraft.



Refuelling the F-111

Loading the F-111
with bombsECM pod on wing
pylon of an F-111



5. The F-111's engine nozzles

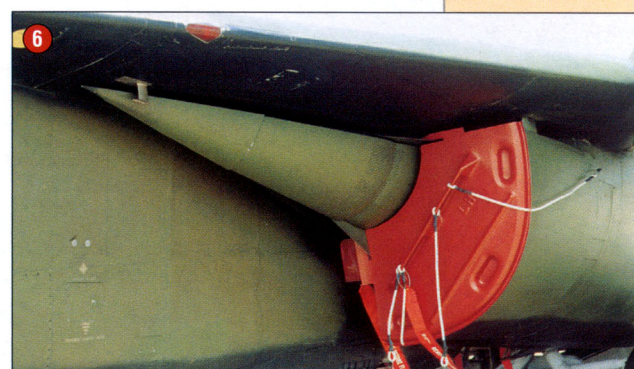
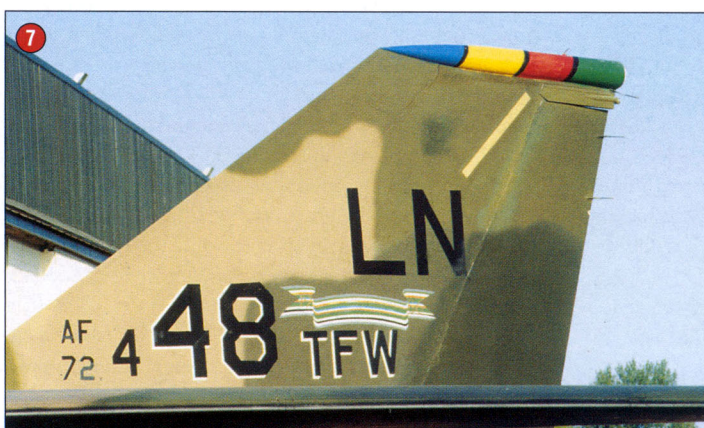
6. Close-up of the intakes of an F-111

7. Tail fin of a Lakenheath F-111

8. Tail fin of an Upper Heyford F-111

9. The EF-111A's distinctive tail fin

10. An EF-111A takes off from Upper Heyford



EF-111A



The second type is the escort mission. Here the Raven will fly with or ahead of the attacking aircraft, jamming acquisition and surveillance radars, heightfinders and communications. The final type is close-in support; here the aircraft fly at high and low altitudes just behind the forward line of battle, suppressing radar defences. In any of the roles the aircraft usually fly in pairs and although primarily for use against ground based radars, they can also be used against shipping.

The need for a dedicated EW Aircraft came about during the Vietnam War when it was estimated that carriage of EW equipment increased aircraft survivability by 80%. At that time it was carried in pods but since then the threats have become far more sophisticated and varied. In 1974 it was therefore decided to develop an EW Aircraft, converted from an F-111A. Developing and testing the systems needed taking over four years, the first aircraft eventually entering service in November 1981.

Most noticeable of the differences between the Raven and the Aardvark is the bulbous pod on top of the tail fin. This contains the receiver and antennae for the aircraft's AN/ALQ-99 noise jamming system which is arranged to give 360 degree coverage. Also in the pod is the ALR-23 infra-red detector, its rearward facing scanner looking like a giant round eye on the flat face of the rear of the pod.

Under the aircraft's fuselage, between the cockpit and wings, is a narrow 4.9m long canoe-shaped radome that carries the transmitters for the AN/ALQ-99E system, while in the weapons

bay is most of the jamming equipment mounted on a pallet. The Raven is also fitted with the AN/ALQ-137 self-protection ECM suite as well as RWR and chaff and flare dispensers.

The aircraft's crew of two consists of pilot and EW Officer, the latter sitting on the right, operating the EW systems control panel and a computer that replaces several operators to ease the workload. All possible threats having been already programmed into the systems software means once in operation the EWO only has to supervise. Because of the space taken up by the control panels the right-hand control stick was removed as well which means the EWO does not have to fly the aircraft either.

Because of the extra weight carried the Raven has more powerful engines than the Aardvark. The TF30-P-109s that are fitted also having translating cowls instead of the blow-in doors. Although there are several other minor differences the most obvious is its colour scheme; while the F-111 is painted green and brown with black nose and underside, the Raven is two-tone compass grey.

With the mid-life update of the F-111s only just completed and the Ravens still relatively new, the immediate future of the family is reasonably assured, politics aside, although already, as a result of the INF treaty, the F-111As will eventually be converted to a new 'G' standard. Also it is believed that the airframe life will take the aircraft into the 21st Century, and with further avionics updates and retrofitting of new technology we should be seeing the F-111 for a long time to come. **MAM**

Close-up of the side of a Raven



Tupolev Tu-2

By Przemysław Skulski

The Tupolev Tu-2 was the best Soviet medium bomber in the period of World War II. The Aircraft was designed in OKB Tupolev in the beginning of the 1940s as a so-called front dive bomber. The first prototype ANT-58 (also known as Samolyot 103 - Aircraft 103) was tested in the air on 29 January 1941 by M.A. Niukhtikov and W.A. Miruc. The powerplants were two AM-37 in-line water-cooled engines (1400 hp each). The second prototype was ANT-59 (Samolyot 103U) and this machine had a redesigned fuselage. The ANT-60 (Samolyot 103W) was a modified version of ANT-59 and became the master for series production. This prototype was tested in flight on 15 December 1941 by M.P. Vasyakin. The most important change was installation of new radial, air-cooled engines M-82 (1300 hp each). The reason was limited capability of production of the AM-37 engines. However the new radial engines M-82 were powerful enough and were also easier to maintain.

In 1942-43 only a small quantity of ANT-60 was produced. The new machine received the designation Tu-2. Some of them were used in combat against the Germans by bomber regiments of the 3rd Aviation Army in Northern Front. The aircraft had many advantages; height, speed, strong armament, great bomb load, big radius of operations. The first series was equipped with air brakes located under the wings (later the air brakes were deleted, but similar effect was achieved by blade incidence angle of AW-9WF propeller). However the Tu-2 had also one big disadvantage - the construction was very advanced and was too complicated for production possibilities of the Soviet aviation industry.

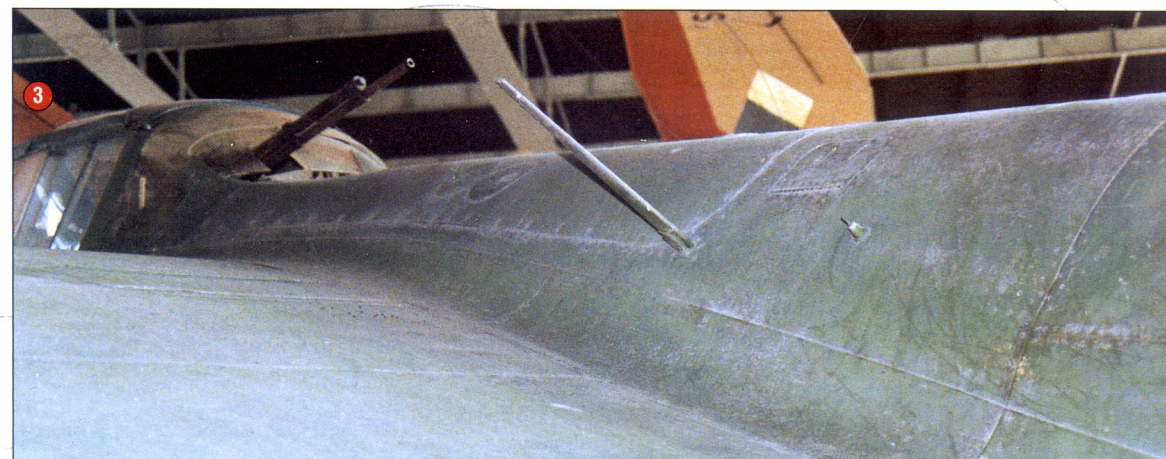
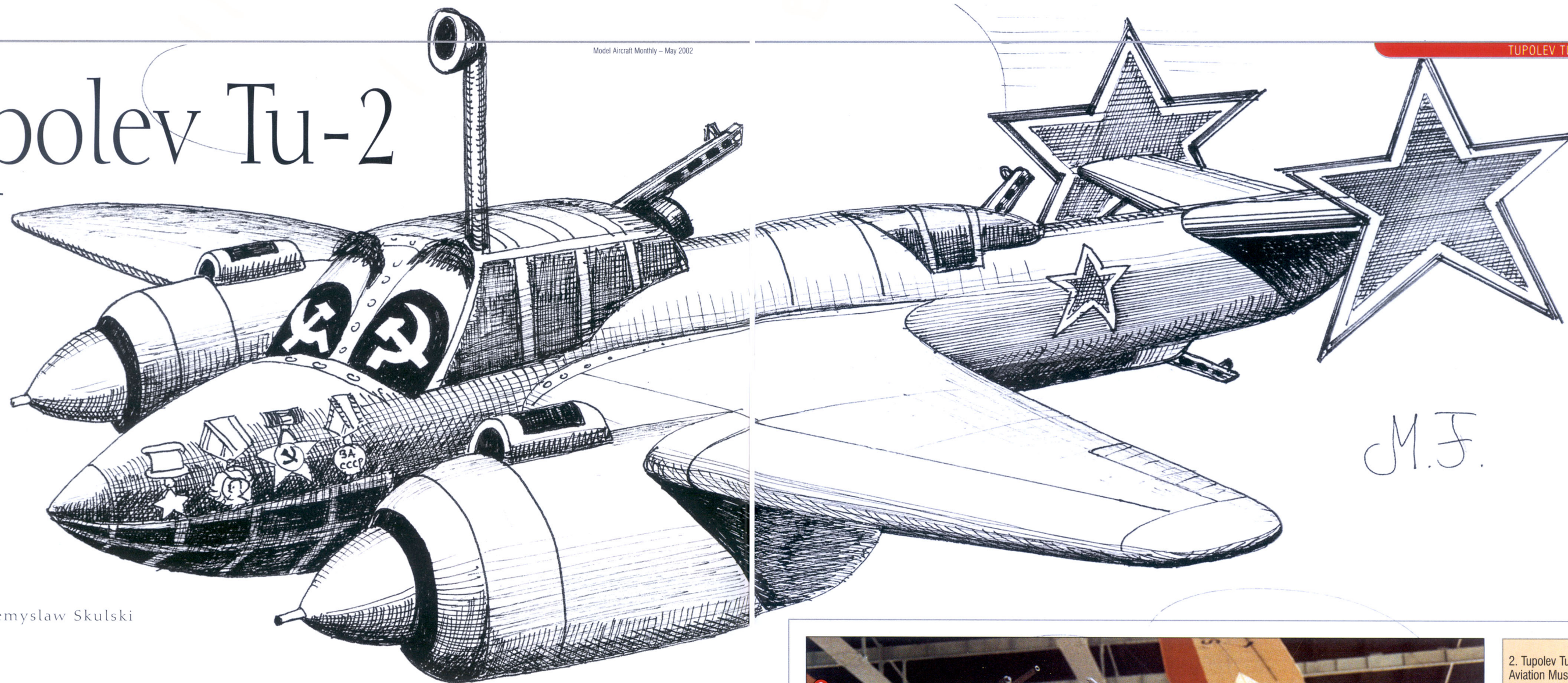
The construction was simplified and the new prototype ANT-61 was tested on 26 August 1943. Production started again



1. The nose of the Tu-2 preserved in the aviation museum in Krakow

in the end of 1943 in Aviation Factory No.23 in Siberia. The aircraft was designated Tu-2S. It was powered by two ASh-82FN 91850 hp each). The armament was very strong and consisted of two ShVAK 20 mm cannon located in the wings and three UBS 12.7 mm machine guns. Tu-2S can carry maximum 2000 kg of bombs. A total of 2527 machines in different versions were produced. In addition to main bomber versions other variants were manufactured: Tu-2Sh (Ground-Attack), Tu-2R (Recce), Tu-2T (Torpedo-bomber), Tu-2D and DB (Long Range Bomber).

The Tu-2 was used not only with the Soviet Air Force but in many other countries. After WWII Tupolev's bomber went to many East European countries - new Soviet allies. One of them was the Polish Air Force. The first machines were posted to



2. Tupolev Tu-2 in the Aviation Museum in Monino

3. Details of the middle section of the fuselage



4. The rear of the fuselage

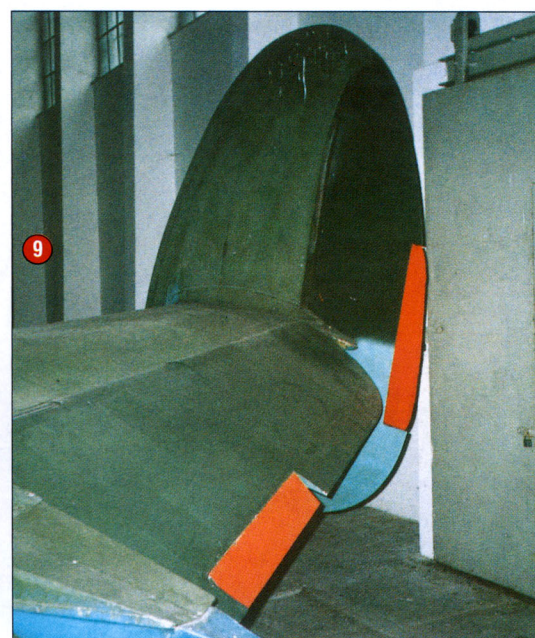
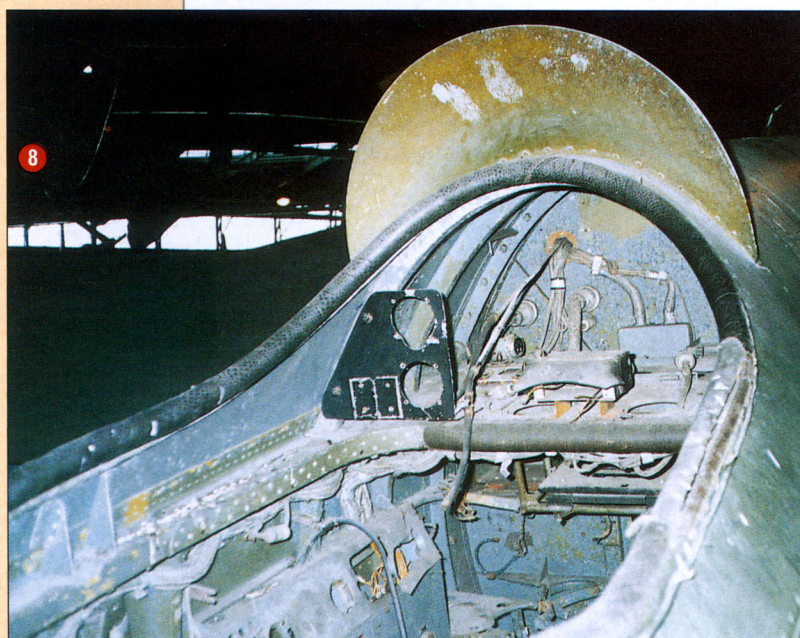
5. The gunner's position under the fuselage

6. The double lights in the left wing

7. The ShVAK 20 mm cannon in the wing

8. The position in the upper fuselage. In the standard bomber it was the gunner's position. The machine in Krakow's museum was rebuilt for the installation of the KK-1 ejection seat

9. The stabilisers





10. The left engine cowlings

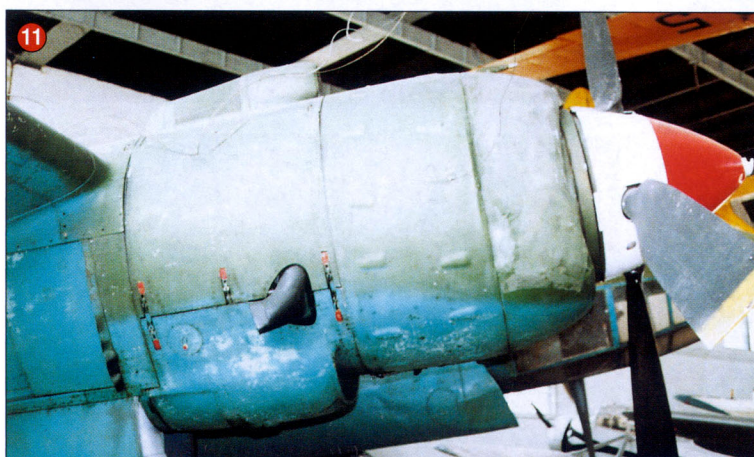
11. The right engine cowlings

12. The exhausts

13. The air intake

14. The AW09WF propeller hub

15. The main landing gear leg



16. Details of the main landing gear strut

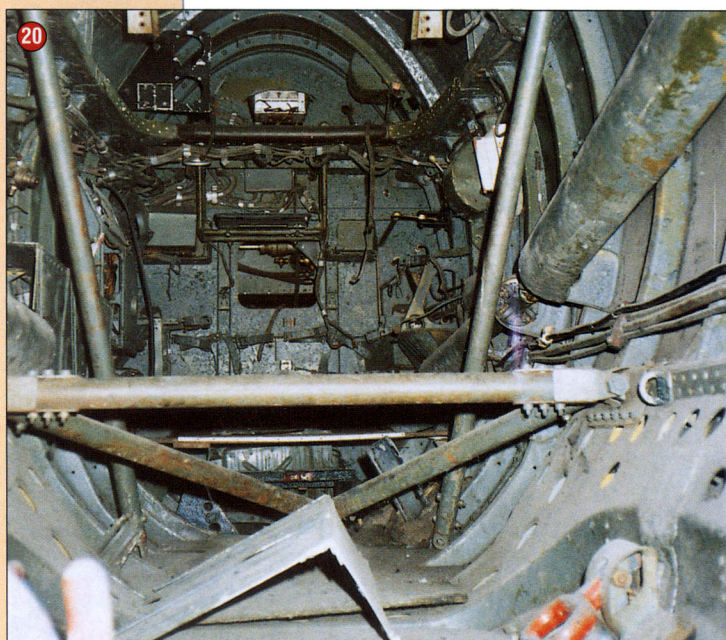
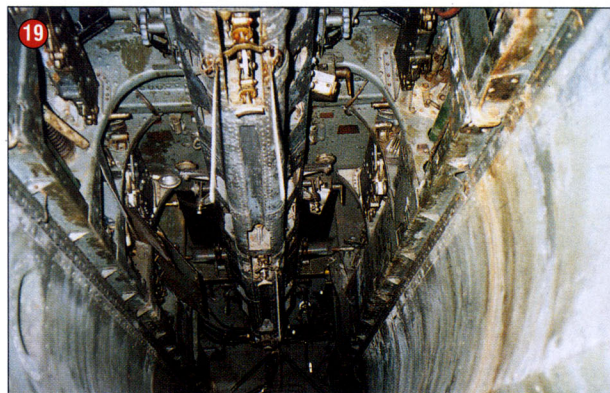
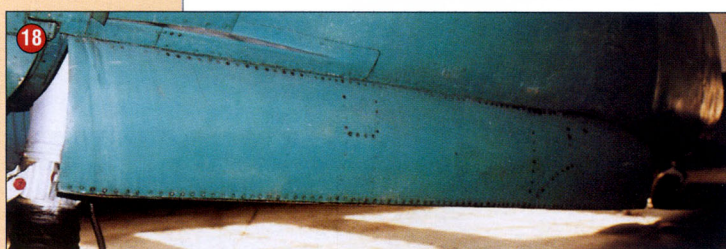
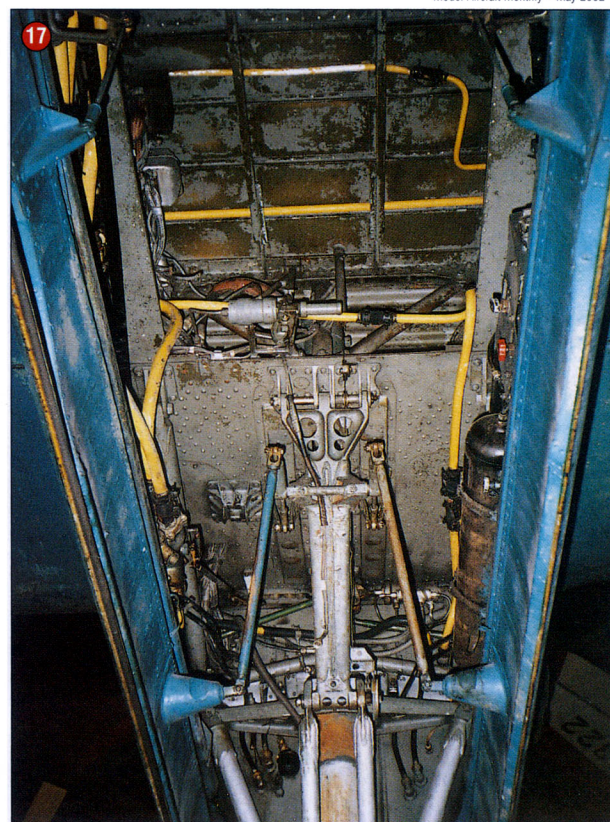
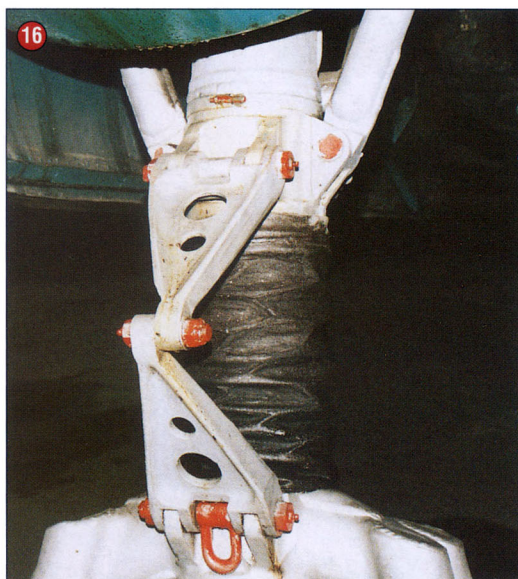
17. The main landing gear bay

18. The doors of the main landing gear bay

19. Details of the bomb bay

20. Details of the rear fuselage construction

21. The doors of the tailwheel



Poland in 1950. They served till 1957 and were replaced by jet bombers - the Ilyushin Il-28 Beagle. Nowadays in Polish museums only two Tupolevs are preserved, the first one in the Military Museum in Warsaw, but this machine is in very bad condition and will soon be restored. The second one, preserved in the Polish Aviation Museum in Krakow, is in much better condition. This machine is presented on the photos. This machine has many details characteristic for later-series Tupolev: double light in the left wing, four-blade propellers, big anti-dust filters, one big window in the fuselage aft (instead of three small), metal construction of the fuselage rear. During service with the Polish Air Force the machine was rebuilt for a specialist version. The top fuselage gunner position was deleted and in that place an installation for the KK-1 ejection seat was mounted. This machine was used for training duties for the aviation crews. **MAM**



22. The tailwheel



Colourful Birds

SPECIAL SCHEMES NO.2 - TIGER-STRIPED SEA KING

by J.B.E. Hale

Fans of both helicopters and Fleet Air Arm subjects were delighted at the release by Revell last year of a new 1/72nd scale kit of the Westland Sea King. Although the Sea King is now in the twilight years of its service with the Royal Navy, a new kit of this important aircraft is nonetheless welcome.

Based on Revell's earlier release of a kit of the Sea King Mk 41 (as operated by the German Navy) this kit includes two additional sprues which provide the parts necessary to enable a model of either the HAS.6 (Anti-Submarine Warfare) or AEW.2 (Airborne Early-Warning) variants to be made. The kit's decal sheet provides markings for three Sea Kings, depicting aircraft as they appeared in the 1999/2000 time-frame; all three options are thus finished in the overall Medium Sea Grey (BS381C) finish of light grey, rather than the much darker grey applied to Sea Kings during their first two decades of service. The Sea Kings depicted on the decal sheet include a single AEW.2, (belonging to B Flight, No.849 Naval Air Squadron) and a choice of two HAS.6 anti-submarine aircraft. One of these is a 'regular' operational Sea King from No.810 NAS whilst the second, the subject of this brief article, is a specially-marked aircraft from the FAA's own 'Tiger' Squadron, No.814 NAS, in a spectacular tiger-striped scheme.

As may be seen from the accompanying photographs, this latter aircraft was an inspired choice of decal options by Revell. Sea Kings in FAA service could never be accused of being gaudy, and this subject provides a welcome splash of colour to a collection of models of modern FAA rotary-winged aircraft - which are, with the notable exception of No.771 NAS' Search and Rescue aircraft, uniformly and unremittingly grey.

Tiger Meet

The remarkable colour scheme applied to XV712 was applied during a visit to the paint-shop at Royal Naval Air Station Portland in the first week of July 1997, in advance of the squadron attending the annual NATO Tiger Meet later in the month. Hosted during 1997 by the Royal International Air Tattoo, the Tiger Meet was staged at RAF Fairford in the week prior to the famous airshow.

Modellers attending the Tattoo were given an excellent opportunity to study the scheme applied to 814's flagship at close hand. A portion of the extensive static park, referred to as the 'Tiger's Lair', was devoted to the display of aircraft participating in the Tiger Meet, and XV712 enjoyed a central location alongside a Czech Mi-24. Better yet, it was parked in a position where it could easily be photographed - something that is not always possible in the crowded static parks at a Tattoo! The aircraft attracted much favourable comment from the assembled modellers and enthusiasts: it was most unusual for a British aircraft to be treated to such an extravagant colour scheme. Most unusual, indeed! Five years later, we now have an appropriate kit and set of decals to reproduce this aircraft in 1/72nd scale.

Unlike many other 'Tiger' colour schemes, that applied to XV712 was not swiftly removed after the conclusion of the Tiger Meet. Indeed, this must have been one of the longest-serving special schemes as the aircraft was resplendent in these colours until the very end of No.814 NAS' time as a Sea King squadron. The squadron said a fond farewell to the Sea King at the end of 2000, having operated this aircraft in all its guises since reforming on 30th March 1973 at RNAS Prestwick.

XV712 flew down to HMS Sultan, near Gosport (the Royal Navy's Air Engineering School) for storage on 20th November 2000, still proud to be a tiger! **MAM**

1. 814's flagship seen aboard HMS Invincible in September 1998, securely parked alongside the island superstructure at the conclusion of flight operations. The Revell kit's decal sheet provides the black tiger stripes to be applied over the yellow painted portions of the airframe



2. Fresh from the paint-shop at RNAS Portland, XV712 proudly shows its new colours to the crowds at the 1997 Royal International Air Tattoo. The tiger scheme applied to XV712 was the most flamboyant ever to be sported by a Sea King from No.814 NAS. Previous special schemes have been simpler, limited to simply adding tiger stripes to the sponsons and applying a tiger's head to the nose. (Decals for this earlier scheme may be found on Model Art's sheet No. 72/035). Note the soft demarcation between the yellow and black, and the obligatory cuddly toy in the cockpit! A veritable forest of aerials may be seen beneath the nose

3. XV712 hovers alongside HMS Invincible prior to recovering aboard. The many bumps and excrescences gathered by the Sea King's airframe during its long service with the Fleet Air Arm are visible in this view. XV712 was one of the initial production batch of Sea Kings, first flying on 8th March 1972. Built as a Sea King HAS.1, the aircraft was subsequently updated to HAS.2, HAS.5 and finally to its current HAS.6 configuration during three decades of service.

4. After a year's hard service, the aircraft was looking a little less pristine than when it appeared at RIAT '97. Note the weathering effect on the rotor blades.



1. La-250 at the Russian Air Force Museum, Monino

2. La-250 '04 Red' at Monino. This is the fourth prototype of the Anaconda



Photo Album

LAVOCHKIN LA-250 (ANACONDA)

by Ken Duffey

3. Port view of the same aircraft

6. Starboard rear end showing the pen-nib fairing between the exhausts

8. Long-range photo showing what appears to be a shallow intake in front of the fin

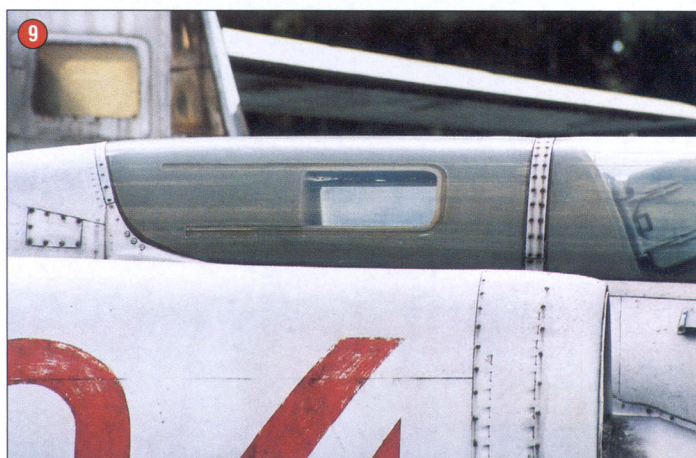




4. Side profile

5. Rear view showing the fin and engine exhausts

7. Front end



9. Navigator's rear cockpit. Note the internal cover with small window

10. Pilot's cockpit showing the headrest of the ejection seat

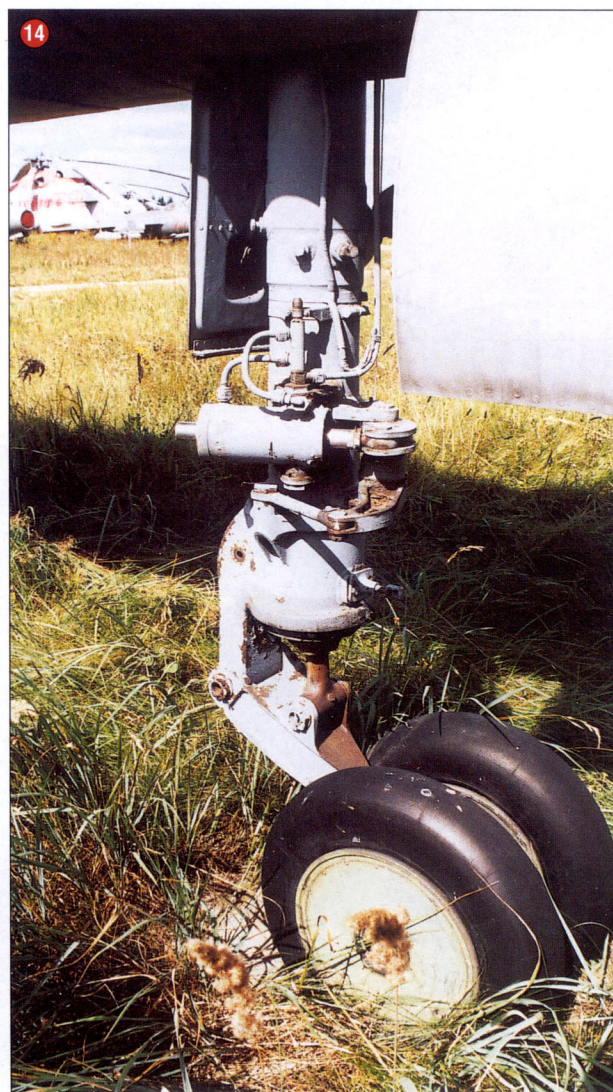


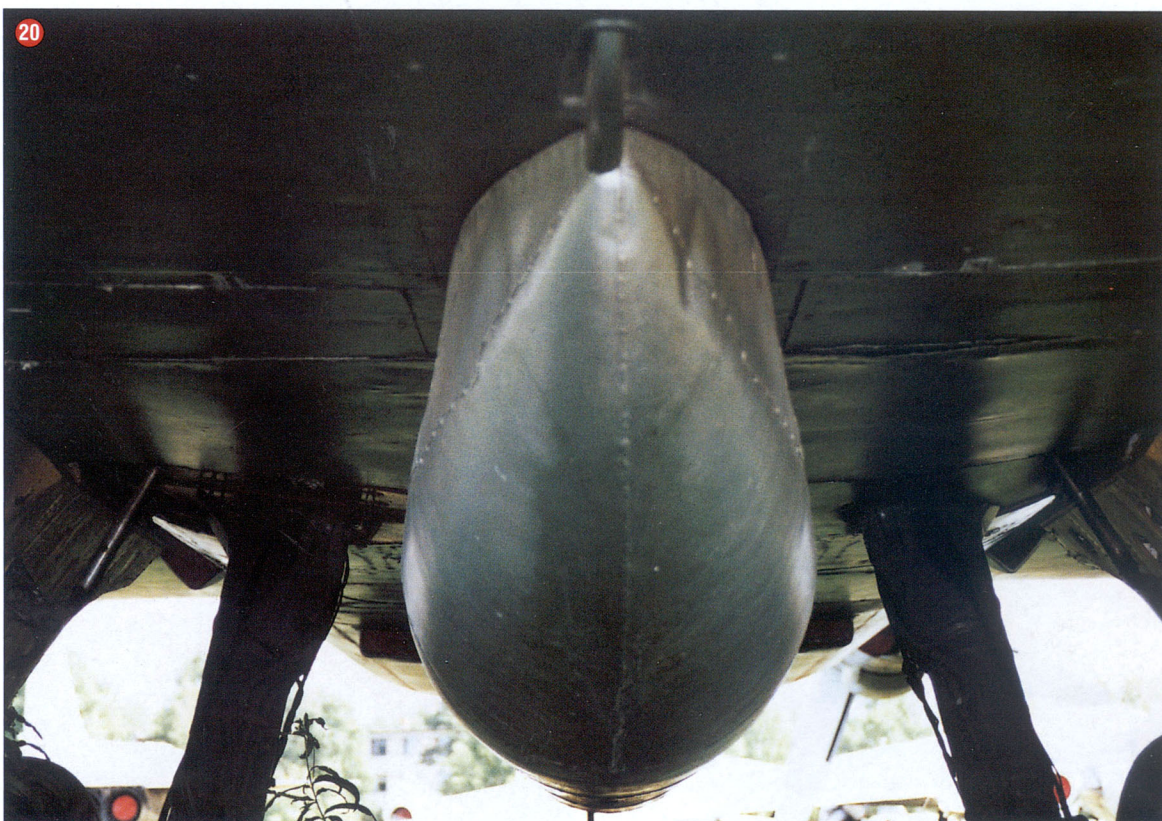
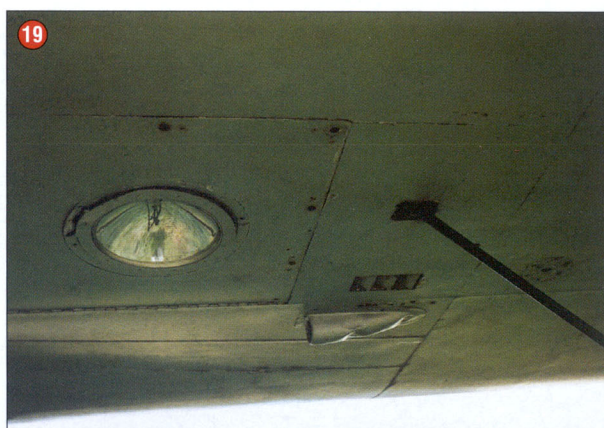
11. Front view - note how the nose is drooped in front of the cockpit and the shape of the intakes. The engine blanking plates are different styles port and starboard

12. Close-up of the port engine intake - complete with blanking plate

13. Port side of nose showing intake semi-circular shock cone

14. Port side view of nosewheel





15. Rear view of nosewheel and leg

16. Inside view of nosewheel door showing the inner skin with perforations

17. Exhaust vents on port side of nose, just behind radome. Presumably for radar cooling

18. Aerial on underside

19. Retractable landing light in lower fuselage, just in front of aerial

20. Fixed belly fuel tank between main undercarriage legs

21. Inner side of port main undercarriage door

22. Port main undercarriage

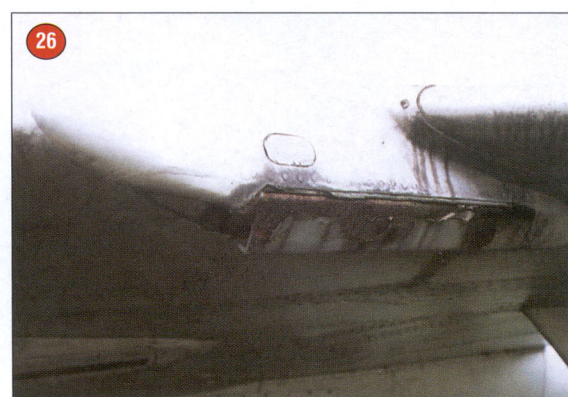
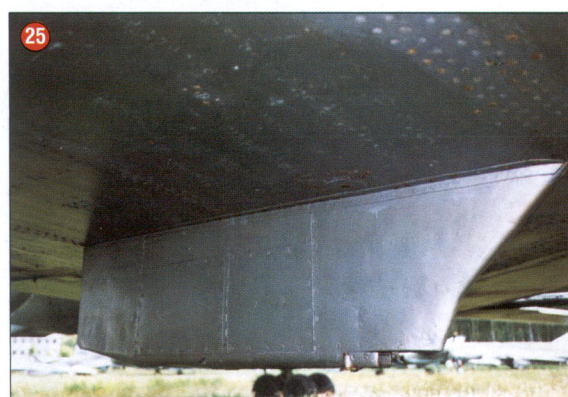
23. Outer view of port main undercarriage door and mainwheel

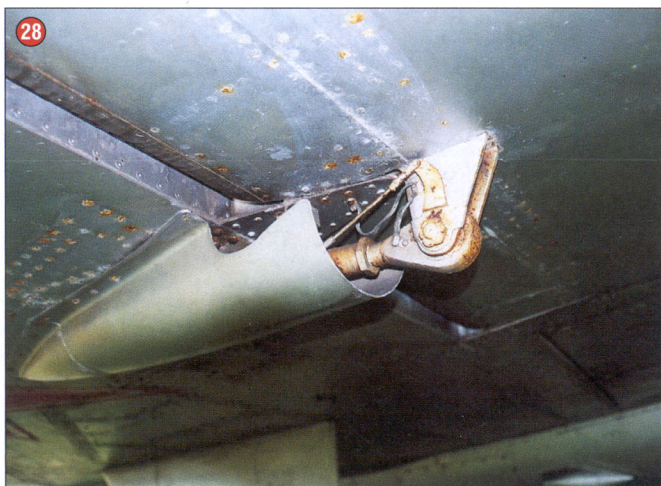


24. View looking along the rear fuselage showing cooling intakes. Note the rear end of the ventral fuel tank

25. Inside face of port wing pylon

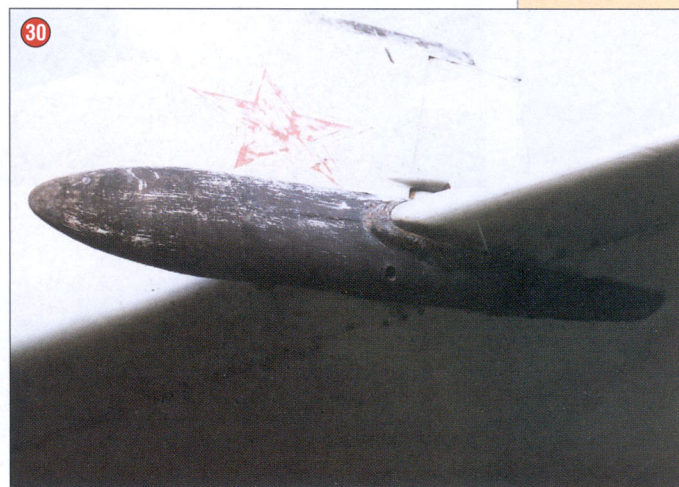
26. Fairing on wing leading edge - outboard of pylon on port side. The port fin of the underwing K-15 missile fits into this slot





27. Another fairing - inboard of the missile pylon. This holds the starboard fin of the missile

28. Aileron actuator and cover on port wing

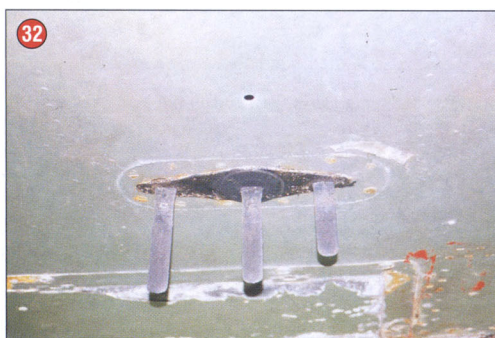


29. Ventral fairing and intake under rear fuselage. It has become dented from the weight of the aircraft resting on a wooden stay

30. Anti-flutter weight on the leading edge of the port elevator



31. Port side of fin

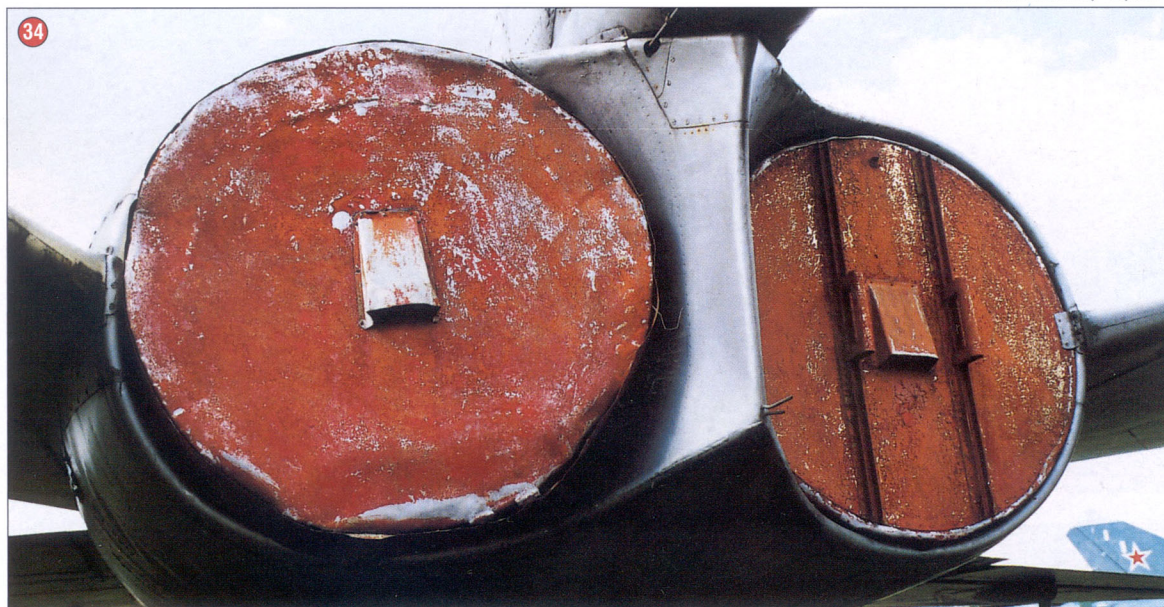


32. 'Odd-Rods' IFF aeriels under rear fuselage



33. Brake parachute housing at base of fin

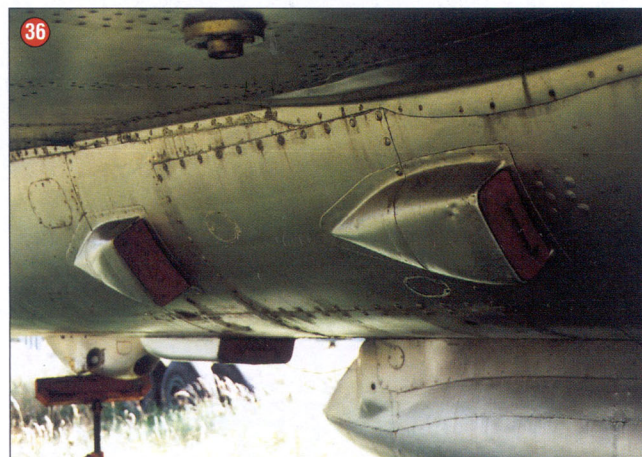
34. Engine exhaust nozzles - covered up with different styles of blanking plates



35. Starboard mainwheel



36. Cooling intakes on starboard rear fuselage



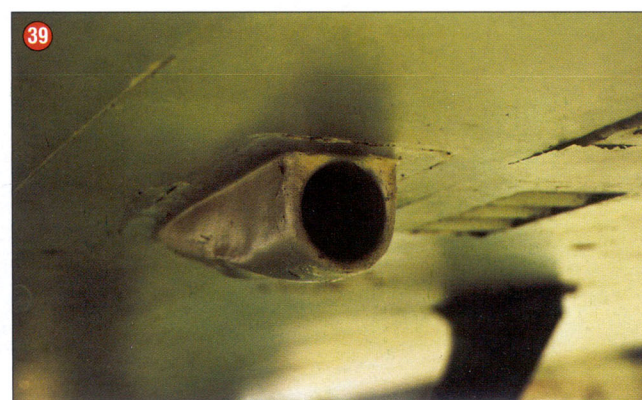
37. Outer face of starboard wing pylon. Note the belly fuel tank and the rear fairing resting on a jack

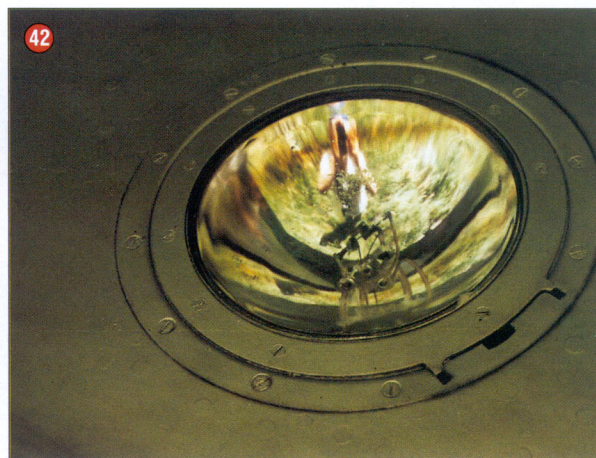
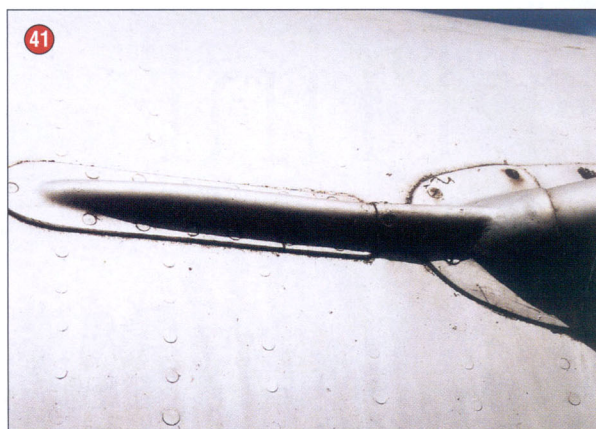
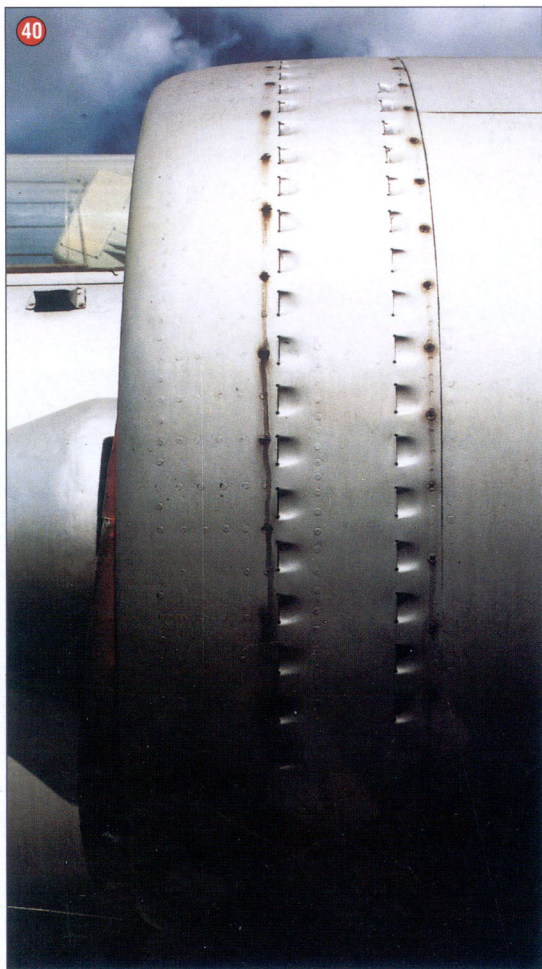


38. Starboard side of nosewheel



39. Intake on front fuselage underside - near to large aerial





40. Close-up of port engine intake showing the two rows of perforations

41. Fairing in front of port wing root

42. Close-up of the retractable landing light

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